Intuition Does Not Lie: The Effect of Individual Differences on the Ability to Accurately Detect Deception.

Lauren McCreanney

1321968

MSc Psychology (Conversion)

PS7112 Research Dissertation

2016/2017

University of Chester

Intuition Does Not Lie:

The Effect of Individual Differences on the Ability to Accurately Detect Deception.

8005 Words

Declaration

This work is original and has not been submitted in relation to any other degree or qualification.

Signature _____ **Date** _____

With thanks to my supervisor Dr Clea Wright for her assistance and support with this piece of research.

University of Chester

Department of Psychology

Research Module Meeting Log 2016/2017

NAME: Lauren McCreanney

SUPERVISOR: Dr Clea Wright

Date	Discussion topics
01/02/2017	Discussion of potential project briefs.
21/03/2017	Meeting to discuss chosen project.
28/03/2017	Meeting to discuss first draft of ethics form and receive feedback.
04/04/2017	Meeting to discuss amendments made to ethics form.
03/05/2017	Meeting to collect resources needed for study.
31/08/2017	Meeting to discuss first full draft of dissertation and receive feedback.

SIGNED

STUDENT _____ DATE: _____

SUPERVISOR DATE: 22/09/2017

Table of contents

List of Tables

Tables

Abstract

Deception detection ability is an area that is not short of research, yet there is currently no definitive explanation for why some people are better than others at spotting a liar. This study surrounds individual differences in deception detection ability of high-stakes lies, and focuses on emotional intelligence level, susceptibility to emotional contagion and facial emotion recognition ability as variables. As these individual differences are all related to emotion-processing, and due to the often emotional nature of high-stakes lies, it is hypothesised that a relationship will be found between deception detection ability and each of these variables. Participants (*n*=60) completed the Schutte Self-Report Emotional Intelligence Test [SSEIT] (Schutte et al., 1998), the Emotional Contagion Scale (Doherty, 1997), and Ekman and Friesen's (1976) Pictures of Facial Affect test, before viewing ten video clips of real life footage of individuals making televised pleas for the safe return of their relative or significant other. Participants were asked to make a veracity judgement of the appealer in each clip. The data was analysed through a standard multiple regression, though no statistically significant results were found to indicate relationships between the variables, conflicting with previous research. Further research is required to gain a greater insight in to each of these variables, though this study has provided a new insight in to the research area surrounding emotional contagion.

Introduction

Deception is a common feature of social interaction (Baker, ten Brinke & Porter, 2012), and often serves to promote social cohesion (Vrij, 2008), therefore psychologists have been interested in deception for decades (Vrij & Verschuere, 2013). This interest has resulted in a large investigation, which has focused on the intentions, characteristics and behaviour of the deceiver (Seiter, Bruschke & Bai, 2002), as well as the ability of those around them, including laypersons and professionals, such as police officers, to detect deception (Elaad, 2009; Ekman & O'Sullivan, 1991; Strömwall & Granhag, 2003). Research studies have been undertaken with the aim of finding new methods for deception detection, specifically in relation to law enforcement and intelligence agencies (Frank & Feeley, 2003; Hartwig, Granhag, Strömwall & Kronkvist, 2006), whilst research has also led to the development of theories surrounding deception and deception detection (Buller & Burgoon, 1996; Levine, 2014; Street, 2015).

Deception researchers have been investigating the notion of nonverbal cues to deceit for over a century (Bond, Howard, Hutchison & Masip, 2013), resulting in the publication of numerous studies with conflicting findings (Vrij, 2008). However, it is now widely believed that the connection between deception and nonverbal cues is weak (DePaulo et al., 2003; Sporer & Schwandt, 2006, 2007), as meta-analyses have revealed that people can only slightly detect deception from the observation of behaviour alone (Bond & DePaulo, 2006). Further, cue training to detect deception has not been successful in improving accuracy levels (Hauch, Sporer, Michael & Meissner,

2014). Despite this, lay observers still believe that nonverbal behavioural cues can reveal deception and often focus on these when making a veracity judgement (Bond et al., 2013; Hartwig & Bond, 2011), potentially providing an explanation for why people do not generally have high accuracy in deception detection (Bond & DePaulo, 2008).

To assess deception detection accuracy, psychologists have tested people's ability to classify statements as either truths or lies (Bond & DePaulo, 2006). Considering that a 50% rate of deception detection accuracy would be expected by chance, research illustrates that overall rates of lie/truth discrimination average approximately 54%, which is slightly but significantly above chance level (Aamodt & Mitchell, 2006; Bond & DePaulo, 2006). People vary in levels of trust (Levine & McCornack, 1991), therefore it would be expected that some people would be more likely than others to detect deception, though lie detection failure has been attributed to the psychological benefits of trust and socialisation to overlook lies (Ekman, 2001). Research suggests that truthful messages are judged correctly more often than deceptive messages (Bond & DePaulo, 2006), whilst there is evidence of a truth bias in laypeople when making a veracity judgement (Vrij, 2008). However, professional lie catchers tend to show a deception bias (Baker, ten Brinke & Porter, 2012), and professional lie catching is associated with an inflated confidence in judgement decisions (Meissner & Kassin, 2002). Yet, both truth and deception biases negatively influence deception detection ability (Vrij, Granhag & Porter, 2011).

On average, people lie twice each day (DePaulo, Kashy, Kirkendol, Wyer & Epstein, 1996), with common motives including altruism, impression management and direct personal advantage of the deceiver (Seto, Khattar, Lalumiere & Quinsey, 1997; Vrij, 2008). All deception judgements have consequences (Granhag & Strömwall, 2004), whether they are correct or incorrect (Bond et al., 1992). Yet high-stakes, real-world deceivers have a lot to lose or gain depending on how they are judged (Frank & Ekman, 1997), and incorrect judgements surrounding high-stakes lies may result in a criminal not being appropriately punished or an innocent person being found guilty of a crime that they did not commit. For every day, low-stakes lies there are few behavioural signs to inform an observer's veracity decision (Hartwig & Bond, 2011), though high motivation to appear credible, alongside the complexity of creating and maintaining a consequential lie, can lead to increased cognitive load and, consequently, greater leakage of behavioural signals (DePaulo, Kirkendol, Tang & O'Brien, 1988; Vrij, Fisher, Mann & Leal, 2008), therefore it may be reasonable to assume that this could result in a greater likelihood of detection. However, research suggests that this is not the case, as high-stakes lies often go undetected by professional lie catchers (Vrij & Mann, 2001).

Researchers have proposed the existence of deception detection 'wizards' who have the ability to consistently and accurately detect deception (O'Sullivan & Ekman, 2004), yet this has led to controversy, with criticism being made about the methodology used within the study, leading to the 'deception detection wizards' being termed as statistical flukes (Bond & Uysal, 2007). Deception detection ability has been researched in relation to individual

differences, as it has been proposed that all individuals differ from one another in lie detection ability, with no wizardry necessary (Aamodt & Mitchell, 2006; Bond & DePaulo, 2008; Porter, Woodworth & Birt, 2000; Vrij & Graham, 1997). It has been hypothesised that deception detection accuracy depends on the receiver's decoding skills (Buller & Burgoon, 1996), sensitivity to deception (Malone & DePaulo, 2001), extraversion (Peace, Porter & Almon, 2011) or Machiavellianism (Zuckerman, DePaulo & Rosenthal, 1981). However, it has been argued that people vary little in their detection skills (Kraut, 1980), and this argument is supported by research that found no positive relationship between a person's ability to accurately identify lies and their ability to accurately identify truths (Levine, Park & McCornack, 1999). Further, evidence suggests that a person's success at spotting women's lies is independent of their success at spotting men's lies (DePaulo & Rosenthal, 1979), and researchers have found no relationship between an individual's accuracy in judging one person and the same individual's accuracy in judging a second person (Bond & DePaulo, 2008; Kraut, 1978). Though, it has been found that participants with experience of deceiving, such as criminal offenders, are better at detecting deception than those with limited experience (Hartwig, Granhag, Strömwall & Andersson, 2004).

Baker, ten Brinke and Porter (2012) believe that individual differences could impair or facilitate an observer's ability to discriminate true or false stories, specifically those that are emotional, such as narratives associated with criminal activity, missing people or murder. This is due to the emotional content of the story, which interacts with the emotional functioning of the receiver, influencing

their judgement of credibility (Campbell & Porter, 2002). This belief is supported by research that found certain personality factors, such as those outlined within the Five-Factor Model (Digman, 1990; John, 1990; McCrae & John, 1992), may influence an individual's ability to accurately make judgements of credibility. Firstly, Peace, Porter and Almon (2011) found that the personality factor of openness to experience was positively associated with accuracy, supporting findings that suggest that people high in openness to new experience have many features required for veracity determinations, such as; divergent and effortful thinking, adaptation of skills and creation of solutions to suit new situations and complex problems (Colquitt, Hollenback, Ilgen, LePine & Sheppard, 2002; Flynn, 2005). Further, neuroticism facilitates effective lie detection (Campbell & Porter, 2002; Peace, Porter & Almon, 2011), yet on the other hand, socially anxious individuals appear to have a disadvantage in the detection of deception (DePaulo & Tang, 1994), and evidence suggests that participants who scored high in sociability and trust were less accurate at detecting false versus genuine accounts of childhood experiences (Campbell & Porter, 2002). Additionally, a negative correlation has been found between extraversion and accuracy (Peace, Porter & Almon, 2011), and this finding may be supported by previous research that observes introversion to be related to use of more stringent decision-making criteria, more detailed processing of stimuli and lower distractibility on tasks (Aron & Aron, 1997; Koelega, 1992; McCrae, 1987). However, it has been argued that personality characteristics may actually influence decision making rather than deception detection accuracy (Baker, ten Brinke & Porter, 2012), and research suggests that skill

level and characteristics of the deceiver override any potential individual differences in the skills of deception detectors (Bond, Omar, Mahmoud & Bonser, 1990).

The majority of deception detection studies have examined lies surrounding non-emotional events, such as a mock crime scenario (Lui & Rosenfeld, 2008; Mertens & Allen, 2008; Park, Suk, Hwang & Lee, 2013), or someone erasing a chalkboard (Vrij, Edward, Roberts & Bull, 2000), whereas few have examined powerful emotional lies associated with high-stakes real-life situations that require the processing of affective information. Subjective ratings of sensory and contextual details of a narrative are higher for negative, relative to positive, events (Barnier, Sharman, McKay & Sporer, 2005). Further, Peace and Sinclair (2012) found evidence of an emotive truth bias, whereas emotional stories tend to be inherently believed, potentially resulting in the quality of the deception detection judgement being influenced by the emotional content and intensity of the lie. Additionally, the emotion aroused in the receiver is often used when making a truthfulness judgement (Semmler & Brewer, 2002), as receivers commonly assess credibility based on the presence of emotional content (Vrij, 2008). Based on this evidence, it is clear that a good evidence base of deception detection research focusing on emotional, high-stakes lies is necessary, in order to provide a comprehensive understanding of deception and deception detection ability as a whole.

Historically, the influence of individual differences has been overlooked within psychological theory, yet it has been argued that individual differences must be considered during the construction of new psychological theory

(Underwood, 1975). Over the past century, the study of individual differences in relation to behaviour, thought and ability has grown in popularity and is now one of the largest sub-disciplines of psychological science (Marsh & Boag, 2013), as psychologists seek to discover why and how people differ (Revelle, Wilt & Condon, 2010). This study will focus on three individual differences; emotional intelligence, emotional contagion and facial emotion recognition.

Emotional Intelligence

The study of intelligence, which long focused solely on cognition (Piaget, 1972; Wechsler, 1939), has adapted, and the experience and expression of emotion is now largely considered a domain of intelligence (Gardner, 1983; Goleman, 1995; Sternberg, 1988). Emotional intelligence [EI] refers to the ability to identify, express and understand emotions, comprehend emotions in thought and regulate both positive and negative emotions in the self and others (Goleman, 1996; Matthews, Zeidner & Roberts, 2002; Mayer, Salovey & Caruso, 2009). Some psychologists argue that EI is more important than IQ level (Goleman, 1996), and longitudinal research has shown that childhood social and emotional abilities such as being able to control emotions, handle frustration and get along with other people has a greater impact on participants' overall life success in comparison to IQ level (Feist & Barron, 1996; Snarey & Vaillant, 1985). Further, research also suggests that emotional and social skills may improve cognitive functioning (Shoda, Mischel & Peake, 1990).

A core attribute of EI is the ability to integrate emotional and cognitive information (Matthews, Zeidner & Roberts, 2002), and it is argued that this attribute is essential for detecting conflict between verbal and nonverbal cues

(Wojciechowski, Stolarski & Matthews, 2014). Individuals with high EI have the ability to use emotions and emotional knowledge to enhance thought (Mayer, Roberts & Barsade, 2008), which may have an impact on accuracy in detecting emotional, high-stakes lies. The relationship between deception and EI has been researched yielding interesting, yet often contradictory, results (Porter, ten Brinke, Baker & Wallace, 2011; Ono, Sachau, Deal, Englert & Taylor, 2011; Warren, Schertler & Bull, 2009).

Firstly, research has found that high EI is positively related to accuracy in detecting emotional, but not unemotional lies (Warren, Schertler & Bull, 2009). Ekman and O'Sullivan (1991) investigated the deception detection ability of a variety of groups, ranging from students to clinical psychologists and Secret Service agents. The results indicated that all groups performed at chance level, with the exception of the Secret Service agents, who were the best performing group (Ekman & O'Sullivan, 1991). The authors of this study speculate that this is due to their greater emotional understanding, a component of EI, and focus on non-verbal cues such as facial emotion information (Ekman & O'Sullivan, 1991). These findings may also be supported by evidence that has found that individuals with psychopathic personalities who focused on structural rather than emotional cues did not have high accuracy in discriminating true and false emotional narrative transcripts (Peace & Sinclair, 2012). Further, evidence suggests that EI positively predicts job performance among criminal investigators (Ono et al., 2011), however it may be useful to note that criminal investigators receive little feedback on the accuracy of their judgements.

Wojciechowski, Stolarski and Matthews (2014) found that individuals high in EI were better able to identify inconsistent facial and verbal stimuli, and the authors conclude that this may result in an advantage for detecting real life emotional deception. Additionally, emotionally intelligent individuals were found to have emotional expertise for adopting deceptive facial expressions in comparison to individuals with low EI (Porter, ten Brinke, Baker & Wallace, 2011). It has been suggested that expertise in deceiving may translate in to enhanced deception detection skills (Fiori, 2009; O'Sullivan, 2005), thus it may be concluded from the research conducted by Porter et al., (2011) that high EI also translates to enhanced deception detection skills.

On the other hand, EI is strongly related to the agreeableness factor of the Five-Factor Model (Digman, 1990; John, 1990; McCrae & John, 1992). Therefore, individuals with high EI may be overly compassionate which could compromise their deception detection ability. Further, individuals with high EI are often more sympathetic to deceptive pleaders, particularly those telling highly emotional lies, which heightens their gullibility (Baker, ten Brinke & Porter, 2012). In addition to this, research suggests that emotionally intelligent individuals may be unable to be analytical of emotional pleas due to an inability to suppress their emotion-focused processing (Baker, ten Brinke & Porter, 2012), whilst it has also been found that high EI individuals empathised with the emotional turmoil associated with deceptive pleas, and perceived all emotional facial expression as genuine (ten Brinke & Porter, 2011).

If EI is found to reliably predict deception detection ability in this study, this may provide evidence to suggest the value of using EI measures when

selecting legal jurors and professionals such as police officers and judges in the future.

Emotional Contagion

It has long been considered that emotions are contagious, and this is evident within psychological and other scientific research (Darwin, 1872; Fowler & Christakis, 2008; Hatfield, Cacioppo & Rapson, 1994; Howes, Hokanson & Lowenstein, 1985; Pugh, 2001; Reik, 1948). Emotional contagion [EC] is defined as the tendency to automatically mimic and synchronise facial, vocal and postural expressions with those of another person's causing them to merge emotionally (Fischer, Shaver & Carnochan, 1990; Hatfield, Cacioppo & Rapson, 1994), and it has been termed a basic form of empathy (Preston & de Waal, 2002; Singer, 2006).

Emotional contagion involves aspects of cognitive, psychophysiological, behavioural and social phenomena (Hatfield, Bensman, Thornton & Rapson, 2014) and as EC can be produced by both innate and acquired stimulus features, as well as mental simulations or emotional imagery, it is considered to be a multiply determined process (Hatfield, Cacioppo & Rapson, 1994). EC is also considered to be a multilevel phenomenon, as the precipitating stimuli from one individual is acted upon by another, or several other, individuals and produces corresponding emotions in these individuals, consequently initiating an emotional, attentional and behavioural synchrony (Hatfield et al., 2014). Further, EC represents a family of phenomena, as it manifests in a complex of responses, for example the stimulus of an angry face, may spark an angry voice

as well as an angry face in another person (Hawk, 2010; Hawk, Fischer & van Kleef, 2012).

Whilst early theorists attributed emotional contagion to imagination and conscious reasoning (Allport, 1961), primitive emotional contagion is considered to be an automatic, uncontrollable and unintentional process that is inaccessible to conversant awareness (Dezecache et al., 2013). Observers rapidly and automatically mimic other people's emotional expressions (Lishner, Cooter & Zald, 2008) resulting in faster emotion recognition (Stel & Van Knippenberg, 2008). Different areas of the brain process the various aspects of emotion, yet the brain integrates the emotional information it receives, therefore each of the emotional components acts on and is acted upon by other people (Hatfield, Cacioppo & Rapson, 1994).

Individuals differ in their susceptibility to emotional contagion (Sonnby-Borgstrom, 2002) and this susceptibility can be measured through self-report questionnaires (Doherty, 1997). People with higher susceptibility to EC are more empathetic, have a higher self-esteem and are more sensitive to others, compared to those with low EC (Doherty, 1997). Further, research has found that those high in EC are better able to discriminate sincere and faked enjoyment expressions (Manera, Grandi & Colle, 2013), yet there is currently no research of this nature that focuses on negative expressions, such as those expected to be depicted in emotional missing person appeals.

There is currently no research available that focuses on emotional contagion in relation to deception detection. Yet, similarly to individuals with high EI, those with high susceptibility to EC have higher empathy and are better able

to experience the emotions of others (Doherty, 1997), therefore it may be reasonable to assume that they would be more likely to perceive someone as genuine and consequently may have higher gullibility to deception.

Facial Emotion Recognition

Facial expressions act as communicatory signals to convey feeling and provide information about the emotional state of others (Haxby, Hoffman & Gobbini, 2002) and, to date, facial expression is considered to be the leading source of information about emotions (Ekman, 2009). The “basic emotion” model theorises that facial expressions are evolutionarily prepared and automatically recognised, requiring little conceptual processing from the perceiver (Ekman, 1973; Ekman & Cordaro, 2011; Levenson, 2011). Further, according to this model, perceivers are able to reflexively decode emotions from visual information alone, as emotion concepts are epiphenomenal to facial emotion perception (Ekman, Friesen & Hager, 2002; Russell, Bachorowski & Fernandez-Dols, 2003).

For successful deception, the verbal message of a lie must be coherent with the nonverbal signals, such as facial expression (Ekman & Friesen, 1971). It has been argued that humans are able to alter their facial expressions to facilitate deception (Livingstone Smith, 2004), and are least likely to show deception in the face, relative to other parts of the body, as people have more ability and motivation to control the face (Ekman & Friesen, 1969). However, the inhibition hypothesis (Ekman, 2003) inspired by Darwin’s (1872) “The Expression of the Emotions in Man and Animals”, a book that has been

described as the beginning of the science of psychology (Ekman, 2009), does not support this argument. Darwin (1872) suggested that certain facial muscle actions associated with emotion cannot be completely supressed, regardless of efforts by the emotion bearer. Additionally, Darwin (1872) proposed that attempts to contract certain facial muscles to simulate emotion would fail (ten Brinke, Porter & Baker, 2012). Nonverbal leakage of lie-related emotions may be due to affective experiences associated with the content of the deception, or to emotions aroused by the act of lying itself (Ekman, 2001). Providing support for the inhibition hypothesis, research has found that involuntary leakage of emotions is ubiquitous, though subtle leakages of emotion are more likely to occur during falsified, in comparison to genuine, expressions (Porter & ten Brinke, 2008). Further, research illustrates that genuine emotion is especially difficult to suppress and more likely to be revealed through facial expression, when it is a strong, relative to a weak, emotional state (Porter, ten Brinke & Wallace, 2011).

Individual differences are considered to effect recognition of facial emotion. Firstly, research surrounding age differences in the recognition of emotion has found that older adults are less accurate at recognising negative emotions, such as anger, sadness and fear (Brosgole & Weisman, 1995; Calder et al., 2003; Isaacowitz et al., 2007; Malatesta, Izard, Culver & Nicolich, 1987; McDowell, Harrison & Demaree, 1994; Sullivan & Ruffman, 2004), though findings suggest age-related stability in recognition of happiness and surprise (Borod et al., 2004; MacPherson, Phillips & Della Sala, 2002; Phillips, MacLean & Allen, 2002).

In addition to the demographic of age, facial emotion recognition research has also focused on the demographic of gender as an individual difference. A common belief across cultures is that women are more emotional, and therefore are expected to experience and express emotions more often than men (Adams, Hess & Kleck, 2015). Thus, it is also assumed that women are superior to men at recognising emotional facial expressions (Hampson, van Anders & Mullin, 2006; Montagne, Kessels, Frigerio, de Haan & Perrett, 2005). Yet, current evidence regarding female superiority in facial emotion recognition is mixed (Wells, Gillepsie & Rotshtein, 2016). It is hypothesised that women have higher empathising capacity (Baron-Cohen, 2002), which may provide an advantage to the recognition of the expressions of others (Hall, Hutton & Morgan, 2010). Wojciechowski, Stolarski and Matthews (2014) found that females scored higher than males on a facial emotion processing task, however the authors of this study argue that this is due to a higher level of EI. Further, it has been argued that female superiority may only occur when the amount of visual information is limited, through the manipulation of expression intensity (Hall & Matsumoto, 2004; Hoffman, Kessler, Eppel, Rukavina & Traue, 2010; Montagne et al., 2005) or the duration of exposure (Hampson, van Anders & Mullin, 2006). Therefore, it may be argued that the female superiority effect may be more reliably associated with response time, rather than differences in accuracy (Rahman, Wilson & Abrahams, 2004; Vassallo, Cooper & Douglas, 2009).

Research suggests that processing facial emotion is important in the detection of deception, as deception is one of the main contexts in which

inconsistent microexpressions are conveyed, due to the emotional leakage that often accompanies lying (Ekman, 2003; Matsumo & Hwang, 2011; Porter & ten Brinke, 2008; Warren, Schertler & Bull, 2009). For example, ten Brinke & Porter (2011) found that deceptive murderers were more likely to express disgust when attempting to express sadness during public appeals. However, it has been argued that, for accurate lie detection, people must avoid misinterpreting the idiosyncrasies of others and making assumptions (Ekman, 2001). Yet, if individuals can detect incongruence between facial and verbal messages, those who have high accuracy in facial emotion recognition may also have high accuracy in detecting deception.

Hypothesis & Rationale

High-stakes lies in a forensic context are likely to be emotional, due to the sensitive nature that surrounds criminal behaviour and the impact that this can have on those effected by the consequences of the lie. Failed detection of deception in forensic and legal settings can have great consequences, therefore an understanding of the type of person that is best able to detect emotional high-stakes lies is vital. As is evident from the literature discussed, individual differences in high-stakes deception detection is an area that is not short of research. Yet, although EI, EC and facial emotion recognition ability are all individual differences relating to emotional processing, a process that may be relevant to detection of high-stakes emotional lies, there does not appear to be a study that incorporates these three individual differences as variables.

This study was undertaken with the intention of providing clarity to an area which consists of evidence that is considered sparse and often contradictory (Manera, Grandi & Colle, 2013). Based on the current literature, three hypotheses are proposed. Firstly, it is hypothesised that there will be a positive correlation between facial emotion recognition and deception detection ability. However, the researcher hypothesises that individuals with high emotional intelligence and high susceptibility to emotional contagion may have higher gullibility, resulting in a reduced ability to accurately detect deception. Therefore, it is hypothesised that there will be a negative relationship between deception detection ability and EI, and deception detection ability and EC. The aim of this study is to find evidence that may provide some clarity to this research area.

Method

Participants

There were 63 participants in total. This research did not require information related to the demographic details of participants, such as age or gender, therefore these details were not collected. The participants were recruited through email (Appendix 1) and word of mouth, and were all known to the researcher. The research complied with the ethical code of the British Psychological Society (British Psychological Society, 2014) and had received ethical approval from the Ethics Committee at the University of Chester (Appendix 2).

Three participants agreed to take part but could not be included in the research. One participant stopped the research partway and two others returned incomplete datasets, therefore their responses could not be included, making the total number of participants who completed the research 60.

Measures

Emotional intelligence was measured using the Schutte Self-Report Emotional Intelligence Test [SSEIT] (Schutte et al., 1998). The SSEIT is a 33-item scale that assesses the utilisation of emotions in solving problems, as well as the appraisal, expression, perception and regulation of emotion in the self and others. For each of the 33 statements, participants were asked to mark their response by acknowledging their level of agreement on a five-point Likert scale, ranging from one, strongly disagree to five, strongly agree. A total score is derived from summing up the item responses, though the scale does include three items that are reverse-scored (Petrides & Furnham, 2000). For the

purpose of this study, the original scale (Schutte et al., 1998) was altered to allow for a ‘prefer not to answer’ option (Appendix 3). It is considered that the SSEIT is a homogeneous construct of emotional intelligence (Petrides & Furnham, 2000), though this assumption has received criticism from those who believe that emotional intelligence is a cognitive ability that should be assessed through problem-solving exercises (Mayer, Salovey & Caruso, 2000). There are multiple EI measures available (Conte, 2005), yet the SSEIT has shown good internal reliability (Jonker & Vosloo, 2008), validity and discriminant validity (Schutte et al., 1998), whilst group differences in score and correlations with other measures have been found to be in accordance with theoretical expectations (Ciarrochi, Chan & Bajgar, 2001; Saklofske, Austin & Minski, 2003). Further, although a lack of stability over time is commonly considered a limitation of self-report measures (Engel & Schutt, 2012), the SSEIT has shown two-week test-retest reliability (Schutte et al., 1998), hence why the SSEIT was chosen for this study.

For this study, the Emotional Contagion [EC] Scale (Doherty, 1997) was used to measure individual differences in the susceptibility of catching the emotions of others. This is a 15-item scale that focuses on five basic emotions; happiness, love, fear, sadness and anger (Doherty, 1997). For each of the 15 statements, participants were asked to select the most appropriate response from a four-point Likert scale (Never, Rarely, Often and Always). This scale was also amended to include a ‘prefer not to answer option’, and a total score can be calculated by summing up each item response (Appendix 4). To avoid acquiescence bias, positively-worded and negatively-worded statements are

included in the scale (Cronbach, 1960). Comparisons with other psychological measures demonstrate the EC Scale's construct validity (Doherty, 1997), and it is considered to be the only self-report measure that assesses susceptibility to emotional contagion cross-culturally (Kevrekidis, Skapinakis, Damigos & Mavreas, 2008). The EC Scale has proven reliability and can be used effectively across a wide range of settings, samples and studies (Doherty, 1997).

Ekman and Friesen's (1976) pictures of facial affect (Ekman & Friesen, 1976) can be used to assess recognition of facial expression and consist of images of faces demonstrating six different emotions: happiness, sadness, fear, anger, disgust and surprise, as well as a neutral facial expression. The Ekman and Friesen (1976) pictures of facial affect are the most extensively used and validated photograph series in facial expression research (Diehl-Schmid et al., 2007). Of 110 available images, 28 were selected for this study, with four different images representing each of the seven emotions, depicted by eight Caucasian models (four male and four female). Previous researchers that have utilised Ekman and Friesen's (1976) pictures of facial affect have presented the images to participants for a limited time, such as 200 milliseconds (Matsumoto et al., 2000), 3 seconds (Sprengelmeyer et al., 1996) or 5 seconds (Young, Perrett, Calder, Sprengelmeyer & Ekman, 2002), however for this study, no time limit was set.

To assess high-stakes deception detection ability, real life footage of individuals making televised pleas for the safe return of their relative or significant other, similar to those broadcast during televised news reports, were utilised. Appeals were used as it is expected that the emotional content and

context involved in appeals would produce emotion in the appealer. Ten video clips, ranging from 17 to 67 seconds in length, involving appealers asking for information about a missing relative were shown to participants. Each videotaped individual made an appeal for the missing person to make contact, for the public to assist in the search or provide information, or for the (assumed) perpetrator to release the person. Five of the clips involved an appealer that is being truthful, whilst five involved an appealer that is being deceptive. After viewing each clip, participants were asked to indicate whether they believed that the appealer was being truthful or deceitful.

Procedure

Participants who were interested in taking part in the research were provided with an information sheet detailing the nature of the research (Appendix 5) and if they were willing to participate, were asked to sign a consent form (Appendix 6). Although included within the participant information sheet, participants were also verbally informed of the potentially upsetting nature of the study and advised to not take part if they felt that this was likely to cause any distress. The researcher was alone with the participant in a quiet setting, and participants were informed that they could withdraw from the research at any time.

Firstly, participants were asked to complete the SSEIT (Schutte et al., 1998), followed by the EC Scale (Doherty, 1997). Participants were informed that they could select the ‘prefer not to answer’ option if they did not feel

comfortable answering any questions on either scale. Following this, participants were shown 28 of the Ekman and Friesen (1976) pictures of facial affect (Appendix 7) as previously discussed, and were asked to indicate which emotion they thought was evident by marking a tick box labelled against the appropriate emotion (Appendix 8). As discussed, participants were not set a time limit during this part of the study, and they controlled the speed at which they made decisions regarding the facial expressions.

For the second part of the study, participants were shown ten short video clips, as previously discussed. After viewing each clip, participants were asked to answer one question; “Do you think that the appealer is telling the truth and is not involved in the person’s disappearance or is being deceptive and is involved?”. To answer the question, participants were asked to tick one of three boxes; one stating that the appealer is being truthful, one stating that the appealer is being deceptive and one stating that the participant has seen this clip before or is familiar with the case (Appendix 9). During the study, nine of the participants indicated that they were familiar with video clip 3, though this will be discussed further. Once the participants had completed the study, all materials were collected by the researcher and participants were provided with a debrief sheet (Appendix 10) which provided further information about the study and contact information for services that could offer support if they had found the research distressing. Participants were not provided with any payment for partaking in the study and, as none of the participants were University of Chester students, no RPS credits were provided.

Analysis and Design

The design of this quantitative study was correlational. The criterion variable was deception detection score and the predictor variables were emotional intelligence score, emotional contagion score and recognition of facial emotion score. A standard multiple regression was used to analyse the data and the information was processed using IBM SPSS Statistical software package, version 22.

Results

For this study the alpha level was set at .05. The emotional intelligence scale has a minimum score of 33 and a maximum score of 165 which denotes a high level of emotional intelligence, whilst the highest possible emotional contagion score was 75, with the minimum score being 15 when all questions were answered. Scores for ability to recognise facial emotion and deception detection were converted in to percentages. Table 1 illustrates the correlation coefficients of the variables.

*Table 1 – Correlation coefficients (N = 60), *p<.05.*

Variables	1.	2.	3.	4.
1. Emotional Intelligence				
2. Emotional Contagion	.157			
3. Facial Emotion Recognition	.224	.183		
4. Deception Detection	-.082	-.095	.028	

Additionally, a test was undertaken to discover if the data met the assumption of collinearity. The results of this test indicated that multicollinearity was not a concern (Emotional Intelligence Score, *Tolerance* = .936*, VIF* = 1.07; Emotional Contagion Score, *Tolerance* = .952, *VIF* = 1.05; Facial Emotion Recognition, *Tolerance* = .927, *VIF* = 1.08).

Emotional intelligence, emotional contagion and facial emotion recognition were entered together in to a standard multiple regression but were

not found to predict a significant amount of variance in explaining deception detection ability, $F(3, 59) = .331$, $p = .803$, Adj, $R^2 = -.035$. Further, the coefficient results illustrate that emotional intelligence ($\beta = -.081$, $t = -.594$, $p = .555$), emotional contagion ($\beta = -.094$, $t = -.694$, $p = .491$) and ability to recognise facial emotion ($\beta = .064$, $t = .465$, $p = .644$) were not significant predictor variables of deception detection ability. The SPSS output for the results is depicted in Appendix 11.

Discussion

Findings

The aim of this study was to test three hypotheses with the objective of exploring the effect of individual differences on deception detection ability. Firstly, it was predicted that there would be a positive correlation between facial emotion recognition and deception detection. Secondly, it was hypothesised that there would be a negative correlation between deception detection ability and EI, and finally there would be a negative correlation between deception detection ability and EC. However, the regression analysis found no significant relationships between the variables, consequently resulting in the rejection of the three hypotheses.

The first hypothesis of this study must be rejected, as no statistically significant relationship was found between deception detection accuracy and facial emotion recognition. This contradicts with research that found that the examination of facial cues to direct credibility assessments was not significantly related to deception detection ability (Baker, ten Brinke & Porter, 2012), and studies concluding that accuracy in identifying microexpressions is correlated with accuracy in deception detection (Ekman & O'Sullivan, 1991). Baker, ten Brinke & Porter (2012) utilised a similar methodology to the present study, involving video clips of public appeals, whereas Ekman and O'Sullivan's (1991) research did not involve high-stakes lies, rather it involved deception regarding the discussion of a film. This may provide an explanation for why the two aforementioned studies found differing results, though it does not explain why

the present study contradicts both of these studies. As discussed, inconsistent microexpressions are often conveyed during deception and are considered a nonverbal leakage cue (Ekman, 2003; ten Brinke & Porter, 2011). Microexpressions may appear for as little as a fraction of a second (Fiori, 2009), and previous researchers have used the masking paradigm, displaying pictures representing facial expressions of the basic emotions for 200 milliseconds, followed by the same person's neutral expression for one second (Ekman & O'Sullivan, 1991; Matsumoto et al., 2000). The present study allowed participants to view the pictures of facial affect (Ekman & Friesen, 1976) with no time limit, yet manipulating the exposure duration of the facial expression may have provided a more real-life context, and consequently could have yielded different results that are more generalisable to a real-world setting. Further, this may explain why no relationship was found, as it may be argued that allowing participants to view the facial expression with no time limit provides an advantage that would otherwise not exist. Therefore, this study may appear to involve participants with a seemingly high ability to recognise facial emotion, whereas if this study had followed the masking paradigm, as discussed above, these participants may have actually received a low score for this aspect of the study.

As discussed, no relationship was found between deception detection ability and EI during this study. Therefore, the results of this study do not support findings that depict a relationship between high EI and enhanced deception detection skills surrounding emotional lies (Ekman & O'Sullivan, 1991; Warren, Schertler & Bull, 2009) or those that have associated EI with an

impairment in evaluating sincerity (Baker, ten Brinke & Porter, 2012; ten Brinke & Porter, 2011).

One of the studies that found a negative relationship between EI and deception detection, as mentioned previously, was conducted by Baker, ten Brinke and Porter (2012). This study also utilised video clips of public appeals, however participants were shown 20 video clips, double the amount used in the current study. Additionally, to assess emotion intelligence level, participants in the aforementioned study completed the Trait EI Questionnaire – Short Form [TEIQue-SF] (Cooper & Petrides, 2010; Petrides & Furnham, 2006), rather than the SSEIT (Schutte et al., 1998). However, as both studies in discussion used similar methodology, though with different measures and number of stimuli, it would be expected that similar results would be reached. It may be considered that the reason for the different results achieved may be within the measures used. The SSEIT has been found to have three factors (Austin, Saklofske, Huang & McKenney, 2004; Saklofske, Austin & Minski, 2003), whilst the TEIQue-SF has a four-factor structure (Furnham & Petrides, 2003; Petrides, Frederickson & Furnham, 2004). This difference may have impacted the results of the self-report results and, consequently, the results of the studies discussed, thus potentially providing an explanation for a difference in results.

On the other hand, Warren, Schertler and Bull (2009) found a positive relationship between performance on an emotional labelling task, indicating high EI, and ability to detect emotional lies. The present research utilised a trait measure of EI, rather than an ability measure such as an emotional labelling task. Ability measures of EI are considered to have greater accuracy in

gathering a representation of an individual's emotional aptitude, as trait measures can be vulnerable to misleading and overconfident responses (Petrides, Pérez-González & Furnham, 2007), which may explain why this study yielded results that conflict with the present study. Additionally, these researchers also used videos, however the deception aspect of their study involved an individual watching a clip of a surgical procedure and describing their reaction as if they were viewing a picturesque scene, or viewing a pleasant scene and describing their reaction as if they were viewing an unpleasant surgical procedure. This study was modelled on a previous research procedure developed by Ekman (Ekman & Friesen, 1974; Ekman, Friesen & O'Sullivan, 1988). Ekman's research involved nursing students as the encoders creating the deception. Ekman argued that the deception was emotional, as it involved an unpleasant surgical procedure that may create arousal in the viewer, and that it was high-stakes as the encoders were told that the ability to hide negative affective reactions would be later related to job performance in the nursing profession (Ekman & Friesen, 1974; Ekman, Friesen & O'Sullivan, 1988). However, Warren, Schertler and Bull (2009) did not do this, therefore although the lie itself may promote emotional arousal, it may not be considered high-stakes, potentially providing an explanation for why the results of this study contradict with those found by Warren et al., (2009).

The results of this study suggest that there is no relationship between EC and deception detection ability. Though there are no studies currently available focusing on EC and deception detection ability as variables, the findings of this study contradict with assumptions that individuals with high susceptibility to EC

may be more gullible to deception due to the increased empathy and sensitivity to others associated with this individual difference (Doherty, 1997). Further, research has found that those high in EC are better able to discriminate sincere and faked enjoyment expressions (Manera, Grandi & Colle, 2013), yet no research has been undertaken focusing on sincere and faked negative expressions, such as worry or distress, as wold be expected from the relative of a missing person. However, the results of this study may provide evidence to suggest that level of EC does not have a direct impact on ability to discriminate sincere and faked negative expressions. Further, although the results of this study were not statistically significant, it can be concluded that there is no relationship between emotional contagion level and deception detection ability, as there is currently no research available to suggest otherwise.

As discussed, previous research has found a truth bias in laypeople making a veracity judgment (Peace & Sinclair, 2012; Vrij, 2008). All of the participants in my study were laypeople, however, a truth bias was not found as, on average, participants stated that less than half of the appealers were being truthful (M=4.34), even though the participant information sheet stated that of the ten appealers, five were being deceptive whilst five were genuine (see Appendix 5). This may provide evidence to suggest that there is in fact no truth bias in laypeople when making veracity judgements. However, it is theorised that receivers are more likely to perceive a person as truthful if they are interacting with that person, rather than seeing the person on videotape (Bond & DePaulo, 2006).

Implications for future research

This study required participants to make immediate veracity judgements of an unacquainted sender's statement based on behavioural information alone. It is believed that veracity judgements made about real-life lies told outside of a research context are typically based upon contextual rather than behavioural information (Park et al., 2002). Further, experimental research suggests that contextual information has greater superiority in comparison to behavioural cues when judging veracity (Blair, Levine & Shaw, 2010; Bond et al., 2013). Therefore, in relation to future research, it may be beneficial to provide contextual information alongside the video clip, such as the relationship between the appealer and the individual in discussion.

As discussed, this study found no relationship between EC and deception detection ability, yet there is currently no other research that has focused on these two variables. Therefore, further research is needed to either provide support for the current findings, or provide an alternative insight in to the relationship between these two variables. This study also found no relationship between deception detection and EI and facial emotion recognition ability, respectively. However, other researchers have presented findings that contradict these results, as discussed. Therefore, further research conducted through studies with a larger sample size or utilising a different methodology may provide a greater insight in to these two variables, and could yield findings that either support or contradict the results of this study.

Limitations

The results of this study may have been impacted by the following limitations. Firstly, EI and EC were assessed through self-report measures (Doherty, 1997; Schutte et al., 1998), therefore responses may have been impacted by self-report bias (Arnold & Feldman, 1981). Social desirability has been termed a threat to the validity of research involving multi-item scales (King & Bruner, 2000) and has been shown to decrease validity of participant responses in multiple studies (Borkenau & Ostendorf, 1989; Ganster, Hennessey & Luthans, 1983). The tendency of individuals to deny socially undesirable behaviours (Chung & Monroe, 2003) and to give positive self-description (Palhus, 2017), may be an issue for the emotional contagion scale in particular as it focuses on an individual's reaction to emotion in others and requires users to rate themselves on socially desirable traits such as empathy (Doherty, 1997). This issue may have been heightened further as all of the participants were known to the researcher. However, although self-reports of behaviour, attitudes and beliefs are prone to social desirability bias (van de Mortel, 2008), it is believed that there are no alternative means of measurement of constructs such as EC (Kimberlin & Winterstein, 2008).

Real-life lies are usually detected in familiar people long after they have been told (Park et al., 2002), therefore it may be argued that low accuracy rates derived from experimental research that involves deceivers unfamiliar to the participant can be attributed to this. Considering this as an issue, it may be concluded that results from laboratory experiments in this area may not be generalisable to real-life contexts.

In comparison to other large studies in this research area, the present study involved a sample of just 60 participants, therefore the issue of statistical power could provide an explanation for the results of this study not being significant. Additionally, a small sample of stimulus materials was utilised in this study, with just ten video clips being shown to participants. Further, as mentioned previously, 15% of participants (*n*=9) were all familiar with one of the ten video clips. The high-profile case depicted in this clip was from 2002 and involved a British family, and the quite recent nature of this case may provide an explanation for why such a large proportion of participants stated that they were familiar with the video clip. Therefore, it may have been beneficial to ensure that all of the clips involved appeals of cases from other countries or, if surrounding British cases, involved cases that were not as a high-profile and from a time that may not be as memorable to participants.

Conclusion

The aim of this study was to provide clarity to the research area of deception detection through the exploration of individual differences in emotional intelligence, emotional contagion and facial emotion recognition. The study found no significant regression between the variables. However, this study adds to the previous literature in this area, and though the researcher acknowledges that this study conducted on a greater scale, with a larger sample of both stimuli and participants, may have produced different results, the findings discussed offer the possibility that there may in fact be no relationship between deception detection ability and individual differences in EI, EC and

facial emotion recognition respectively. Additionally, this study provides a new insight in to the study of emotional contagion, an area that is short of research, and specifically in relation to deception detection ability, this study appears to be the first of its kind.

References

Aamodt, M. G., & Mitchell, H. (2006). Who can best catch a liar? A meta-analysis of individual differences in detecting deception. *Forensic Examiner, 15,* 6-11.

Adams, R. B., Hess, U., & Kleck, R. E. (2015). The intersection of gender-related facial appearance and facial displays of emotion. *Emotion Review, 7*(1), 5-13. http://dx.doi.org/10.1177/1754073914544407

Allport, G. W. (1961). *Pattern and growth in personality.* New York, NY: Holt, Rinehart and Winston.

Arnold, H. J., & Feldman, D. C. (1981). Social desirability response bias in self-report choice situations. *Academy of Management Journal, 24*(2), 377-385. http://dx.doi.org/10.2307/255848

Aron, E. N., & Aron, A. (1997). Sensory-processing sensitivity and its relation to introversion and emotionality. *Journal of Personality and Social Psychology, 73(2),* 345–368. *http://dx.doi.org/10.1037//0022-3514.73.2.345*

Austin, E. J., Saklofske, D. H., Huang, S. H. S., & McKenney, D. (2004). Measurement of trait emotional intelligence: Testing and cross-validating a modified version of Schutte et al.'s (1998) measure. *Personality and Individual Differences, 36*, 555–562. http://dx.doi.org/10.1016/s0191-8869(03)00114-4

Baker, A., ten Brinke, L., & Porter, S. (2012). Will get fooled again: Emotionally intelligent people are easily duped by high-stakes deceivers. *Legal and Criminological Psychology, 18* (2)*,* 300-313. http://dx.doi.org/10.1111/j.2044-8333.2012.02054.x

Barnier, A. J., Sharman, S. J., McKay, L., & Sporer, S. L. (2005). Discriminating adults' genuine, imagined, and deceptive accounts of positive and negative childhood events. *Applied Cognitive Psychology, 19*(8)*,* 985-1001. http://dx.doi.org/10.1002/acp.1139

Baron-Cohen, S. (2002). The extreme male brain theory of autism. *Trends in Cognitive Sciences, 6*(6), 248-254. http://dx.doi.org/10.1016/s1364-6613(02)01904-6

Blair, J. P., Levine, T. R., & Shaw, A. S. (2010). Content in context improves deception detection accuracy. *Human Communication Research, 36*(3), 423-442. http://dx.doi.org/10.1111/j.1468-2958.2010.01382.x

Bond, C. F., Omar, A., Mahmoud, A., & Bonser, R. N. (1990). Lie detection across cultures. *Journal of Nonverbal Behaviour, 14*(3)*,* 189-204. http://dx.doi.org/10.1007/bf00996226

Bond, C. F., Omar, A., Pitre, U., Lashley, B. R., Skaggs, L. M., & Kirk, C. T. (1992). Fishy-looking liars: Deception judgment from expectancy violation. *Journal of Personality and Social Psychology, 63*(6), 969-977. http://dx.doi.org/10.1037/0022-3514.63.6.969

Bond, C. F., & DePaulo, B. M. (2006). Accuracy of deception judgments. *Personality and Social Psychology Review, 10*(3), 214-234. http://dx.doi.org/10.1207/s15327957pspr1003_2

Bond, C. F., & DePaulo, B. M. (2008). Individual differences in judging deception: Accuracy and bias. *Psychological Bulletin, 134*(4), 477-492. http://dx.doi.org/10.1037/0033-2909.134.4.477

Bond, C. F., Howard, A. R., Hutchison, J. L., & Masip, J. (2013). Overlooking the obvious: Incentives to lie. *Basic and Applied Social Psychology, 35*(2), 212-221. http://dx.doi.org/10.1080/01973533.2013.764302

Borkenau, P., & Ostendorf, F. (1989). Descriptive consistency and social desirability in self- and peer-reports. *European Journal of Personality, 3*(1), 31-45. http://dx.doi.org/10.1002/per.2410030105

Borod, J. C., Yecker, S. A., Brickman, A. M., Moreno, C. R., Sliwinski, M., Foldi, N. S., … & Welkowitz, J. (2004). Changes in posed facial expression of emotion across the adult life span. *Experimental Aging Research*, *30*(4), 305–331. http://dx.doi.org/10.1080/03610730490484399

British Psychological Society. (2014). *Code of human research ethics.* Leicester, United Kingdom: Author.

Brosgole, L., & Weisman, J. (1995). Mood recognition across the ages. *International Journal of Neuroscience, 82*(3-4), 169–189. http://dx.doi.org/10.3109/00207459508999800

Buller, D. B., & Burgoon, J. K. (1996). Interpersonal deception theory. *Communication Theory, 6,* 203-242. http://dx.doi.org/10.1002/9781118540190.wbeic170

Calder, A. J., Keane, J., Manley, T., Sprengelmeyer, R., Scott, S., Nimmo-Smith, I., & Young, A. W. (2003). Facial expression recognition across the adult life span. *Neuropsychologia, 41*(2), 195–202. http://dx.doi.org/10.1016/s0028-3932(02)00149-5

Campbell, M. A., & Porter, S. (2002). Pinpointing reality: How well can people judge true and mistaken emotional childhood memories? *Canadian Journal of Behavioural Science, 34*(4), 217-229. http://dx.doi.org/10.1037/h0087174

Chung, J., & Monroe, G. S. (2003). Exploring social desirability bias. *Journal of Business Ethics, 44*(4)*,* 291-302. http://dx.doi.org/10.1023/a:1023648703356

Ciarrochi, J., Chan, A. Y. C., & Bajgar, J. (2001). Measuring emotional intelligence in adults. *Personality and Individual Differences, 31*(7), 1105-1119. http://dx.doi.org/10.1016/s0191-8869(00)00207-5

Colquitt, J. A., Hollenbeck, J. R., Ilgen, D. R., LePine, J. A., & Sheppard, L. (2002). Computer-assisted communication and team decision-making performance: The moderating effect of openness to experience. *Journal of Applied Psychology, 87*(2), 402-410. http://dx.doi.org/10.1037//0021-9010.87.2.402

Conte, J. M. (2005). A review and critiques of emotional intelligence measures. *Journal of Organizational Behaviour, 26,* 433-440. http://dx.doi.org/10.1002/job.319

Cooper, A., & Petrides, K. V. (2010). A psychometric analysis of the Trait Emotional Intelligence Questionnaire – Short Form (TEIQue-SF) using Item Response Theory. *Journal of Personality Assessment, 92,* 449-457. http://dx.doi.org/10.1080/00223891.2010.497426

Cronbach, L. J. (1960). *Essentials of psychological testing* (2nd ed.). New York, NY: Harper.

Darwin, C. (1872). *The expression of the emotions in man and animals.* Chicago, IL: University of Chicago Press.

DePaulo, B. M., & Rosenthal, R. (1979). Telling lies. *Journal of Personality and Social Psychology, 37*(10)*,* 1713-1722. http://dx.doi.org/10.1037//0022-3514.37.10.1713

DePaulo, B. M., Kirkendol, S. E., Tang, J., & O'Brien, T. P. (1988). The motivational impairment effect in the communication of deception: Replications and extensions. *Journal of Nonverbal Behavior*, *12*(3), 177–202. http://dx.doi.org/10.1007/bf00987487

DePaulo, B, M., & Tang, J. (1994). Social anxiety and social judgement: The example of detecting deception. *Journal of Research in Personality, 28*(2)*,* 142-153. http://dx.doi.org/10.1006/jrpe.1994.1012

DePaulo, B. M., Kashy, D. A., Kirkendol, S. E., Wyer, M. M., & Epstein, J. A. (1996). Lying in everyday life. *Journal of Personality and Social*

Psychology, 70(5), 979-995. http://dx.doi.org/10.1037//0022-3514.70.5.979

DePaulo, B. M., Lindsay, J. J., Malone, B. E., Muhlenbruck, L., Charlton, K., & Cooper, H. (2003). Cues to deception. *Psychological Bulletin, 129*(1), 74-112. http://dx.doi.org/10.1037//0033-2909.129.1.74

Dezecache, G., Conty, L., Chadwick, M., Phillip, L., Soussignan, R., Sperber, D., & Grèzes, J. (2013). Evidence for unintentional emotional contagion beyond dyads. *PloS ONE, 8*(6), e67371. http://dx.doi.org/10.1371/journal.pone.0067371

Diehl-Schmid, J., Pohl, C., Ruprecht, C., Wagenpfeil, S., Foerstl, H., & Kurz, A. (2007). The Ekman 60 Faces Test as a diagnostic instrument in frontotemporal dementia. *Archives of Clinical Neuropsychology, 22*(4), 459-464. http://dx.doi.org/10.1016/j.acn.2007.01.024

Digman, J. M. (1990). Personality structure: Emergence of the five-factor model. *Annual Review of Psychology, 41*(1), 417-440. http://dx.doi.org/10.1146/annurev.psych.41.1.417

Doherty, R. W. (1997). The emotional contagion scale: A measure of individual differences. *Journal of Nonverbal Behaviour, 21,* 131-154. https://dx.doi.org/10.1037/t07987-000

Ekman, P., & Friesen, W. V. (1969). The repertoire of nonverbal behaviour: Categories, origins, usage, and coding. *Nonverbal Communication, Interaction, and Gesture, 1,* 49-98. http://dx.doi.org/10.1515/9783110880021.57

Ekman P., & Friesen, W. V. (1971). Constants across cultures in the face and emotion. *Journal of Personality & Social Psychology,* 17(2), 124-129. http://dx.doi.org/10.1037/h0030377

Ekman, P. (1973). Cross-cultural studies of facial expression. In P. Ekman (Ed.), *Darwin and facial expression: A century of research in review* (pp. 169–222). New York, NY: Academic.

Ekman, P., & Friesen, W. V. (1974). Detecting deception from the body or face. *Journal of Personality and Social Psychology, 29*(3), 288–298. http://dx.doi.org/10.1037/h0036006

Ekman, P., & Friesen, W. V. (1976). *Pictures of facial affect.* Palo Alto, CA: Consulting Psychologists Press.

Ekman, P., & O'Sullivan, M. (1991). Who can catch a liar? *American Psychologist, 46*(9), 913-920. http://dx.doi.org/10.1037//0003-066x.46.9.913

Ekman, P., Friesen, W. V., & O'Sullivan, M. (1988). Smiles when lying. *Journal of Personality and Social Psychology*, *54*(3), 414–420. http://dx.doi.org/10.1037//0022-3514.54.3.414

Ekman, P. (2001). *Telling lies: Clues to deceit in the marketplace, politics, and marriage.* (3rd ed.). New York, NY: Norton.

Ekman, P., Friesen, W. V., & Hager, J. C. (2002). *Facial action coding system.* Retrieved from http://www.worldlibrary.org/

Ekman, P. (2003). Darwin, deception and facial expression. In P. Ekman, & R. Davidson, & F. DeWaals (Eds.), *Annals of the New York Academy of Sciences, Vol. 1000*. (pp. 205–221). New York, NY: New York Academy of Sciences.

Ekman, P. (2009). Darwin's contributions to our understanding of emotional expressions. *Philosophical Transactions of the Royal Society of London, Series B, Biological Sciences, 364*(1535), 3449-3451. http://dx.doi.org/10.1098/rstb.2009.0189

Ekman, P., & Cordaro, D. (2011). What is meant by calling emotions basic. *Emotion Review, 3*(4), 364–370. http://dx.doi.org/10.1177/1754073911410740

Elaad, E. (2009). Lie-detection biases among male police interrogators, prisoners, and laypersons. *Psychological Reports, 105*(3), 1047-1056. http://dx.doi.org/10.2466/pr0.105.f.1047-1056

Engel, R. J., & Schutt, R. K. (2012). *The practice of research in social work.* (3rd ed.) Thousand Oaks, CA: Sage.

Feist, G. J., & Barron, F. (1996, June). *Emotional intelligence and academic intelligence in career and life success.* Paper presented at the Annual Convention of the American Psychological Societ, San Francisco, CA.

Fiori, M. (2009). A new look at emotional intelligence: A dual-process framework. *Personality and Social Psychology Review, 13*(1), 21–44. http://dx.doi.org/10.1177/1088868308326909

Fischer, K. W., Shaver, P. R., & Carnochan, P. (1990). How emotions develop and how they organise development. *Cognition and Emotion, 4*(2), 81-127. http://dx.doi.org/10.1080/02699939008407142

Flynn, F. J. (2005). Having an open mind: The impact of openness to experience on interracial attitudes and impression formation. *Journal of Personality and Social Psychology, 88*(5), 816–826. http://dx.doi.org/10.1037/0022-3514.88.5.816

Fowler, J. H., & Christakis, N. A. (2008). Dynamic spread of happiness in a large social network: Longitudinal analysis over 20 years in the Framingham Heart Study. *BMJ, 337,* 1-9. http://dx.doi.org/10.1136/bmj.a2338

Frank, M. G., & Ekman, P. (1997). The ability to detect deceit generalises across different types of high-stake lies. *Journal of Personality and Social Psychology, 72*(6), 1429-1439. http://dx.doi.org/10.1037//0022-3514.72.6.1429

Frank, M. G., & Feeley, T. H. (2003). To catch a liar: Challenges for research in lie detection training. *Journal of Applied Communication Research, 31,* 58-75. http://dx.doi.org/10.1080/00909880305377

Furnham, A., & Petrides, K. V. (2003). Trait emotional intelligence and happiness. *Social Behaviour and Personality, 31*, 815–823. http://dx.doi.org/10.2224/sbp.2003.31.8.815

Ganster, D. C., Hennessey, H. W., & Luthans, F. (1983). Social desirability response effects: Three alternative models. *Academy of Management Journal, 26*(2), 321-331. http://dx.doi.org/10.2307/255979

Gardner, H. (1983). *Frame of mind: The theory of multiple intelligences.* New York, NY: Basic Books.

Goleman, D. (1995). *Emotional intelligence.* New York, NY: Bantam Books.

Goleman, D. (1996). Emotional intelligence: Why it can matter more than IQ. *Learning, 24*(6), 49-50. http://dx.doi.org/10.1037/h0095822

Granhag, P. A., & Strömwall, L. A. (2004). *The detection of deception in forensic contexts.* New York, NY: Cambridge University Press.

Hall, J. A., & Matsumoto, D. (2004). Gender differences in judgements of emotions from facial expressions. *Emotion, 4*(2)*,* 201-206. http://dx.doi.org/10.1037/1528-3542.4.2.201

Hall, J. K., Hutton, S. B., & Morgan M. J. (2010). Sex differences in scanning faces: Does attention to the eyes explain female superiority in facial expression recognition? *Cognition & Emotion*, *24*(4), 629–637. http://dx.doi.org/10.1080/02699930902906882

Hampson, E., van Anders, S. M., & Mullin, L. (2006). A female advantage in the recognition of emotional facial expressions: Test of an evolutionary hypothesis. *Evolution and Human Behaviour, 27*(6), 401-416. http://dx.doi.org/10.1016/j.evolhumbehav.2006.05.002

Hartwig, M., Granhag, P. A., Strömwall, L. A., & Andersson, L. O. (2004). Suspicious minds: Criminals' ability to detect deception. *Psychology,*

Crime and Law, 10, 83–95. http://dx.doi.org/10.1080/1068316031000095485

Hartwig, M., Granhag, P. A., Strömwall, L. A., & Kronkvist, O. (2006). Strategic use of evidence during police interviews: When training to detect deception works. *Law and Human Behaviour, 30,* 603-619. http://dx.doi.org/10.1007/s10979-006-9053-9

Hartwig, M., & Bond, C. F. (2011). Why do lie-catchers fail? A lens model meta-analysis of human lie judgments. *Psychological Bulletin, 137*(4), 643-659. http://dx.doi.org/10.1037/a0023589

Hatfield, E., Cacioppo, J. T., & Rapson, R. L. (1994). *Emotional contagion*. Cambridge, United Kingdom: Cambridge University Press.

Hatfield, E., Bensman, L., Thornton, P. D., & Rapson, R. L. (2014). New perspectives on emotional contagion: A review of classic and recent research on facial mimicry and contagion. *Interpersona: An International Journal on Personal Relationships, 8*(2), 159-179. http://dx.doi.org/10.5964/ijpr.v8i2.162

Hauch, V., Sporer, S. L., Michael, S. W., & Meissner, C. A. (2014). Does training improve the detection of deception? A meta-analysis. *Communication Research, 43*(3), 283-343. http://dx.doi.org/10.1177/0093650214534974

Hawk, S. T. (2010). *Changing channels: Flexibility in empathetic emotion processes.* New York, NY: Paragon.

Hawk, S. T., Fischer, A. H., & van Kleef, G. A. (2012). Face the noise: Embodied responses to nonverbal vocalisations of discrete emotions. *Journal of*

Personality and Social Psychology, 102, 796-814. http://dx.doi.org/10.1037/a0026234

Haxby, J. V., Hoffman, E. A., & Gobbini, M. I. (2002). Human neural systems for face recognition and social communication. *Biological Psychiatry, 51,* 59-67. http://dx.doi.org/10.1016/s0006-3223(01)01330-0

Hoffmann, H., Kessler, H., Eppel, T., Rukavina, S., & Traue, H. C. (2010). Expression intensity, gender and facial emotion recognition: Women recognize only subtle facial emotions better than men. *Acta Psychologica, 135*(3), 278-283. http://dx.doi.org/10.1016/j.actpsy.2010.07.012

Howes, M. J., Hokanson, J. E., & Lowenstein, D. A. (1985). Induction of depressive affect after prolonged exposure to a mildly depressed individual. *Journal of Personality and Social Psychology, 49*(4)*,* 1110-1113. http://dx.doi.org/10.1037//0022-3514.49.4.1110

Isaacowitz, D. M., Löckenhoff, C. E., Lane, R. D., Wright, R., Sechrest, L., Riedel, R., & Costa, P. T. (2007). Age differences in recognition of emotion in lexical stimuli and facial expressions. *Psychology and Aging, 22*(1), 147-159. http://dx.doi.org/10.1037/0882-7974.22.1.147

John, O. P. (1990). The “Big Five” factor taxonomy: Dimensions of personality in the natural language and in questionnaires. In L. A. Pervin (Ed.), *Handbook of personality: Theory and research* (pp. 66-100). New York, NY: Guilford Press.

Jonker, C. S., & Vosloo, C. (2008). The psychometric properties of the Schutte Emotional Intelligence Scale: Empirical research. *SA Journal of Industrial Psychology, 34*(2), 21-30. http://dx.doi.org/10.4102/sajip.v34i2.689

Kevrekidis, P., Skapinakis, P., Damigos, D., & Mavreas, V. (2008). Adaption of the Emotional Contagion Scale (ECS) and gender differences within the Greek cultural context. *Annals of General Psychiatry, 7,* 14. http://dx.doi.org/10.1186/1744-859x-7-14

Kimberlin, C. L., & Winterstein, A. G. (2008). Validity and reliability of measurement instruments used in research. *American Journal of Health-System Pharmacy, 65*(23), 2276-2284. http://dx.doi.org/10.2146/ajhp070364

King, M. F., & Bruner, G. C. (2000). Social desirability bias: A neglected aspect of validity testing. *Psychology & Marketing, 17*(2), 79-103. http://dx.doi.org/10.1002/(sici)1520-6793(200002)17:2<79;;aid-mar2>3.0.co;2-0

Koelega, H. S. *(*1992*).* Extraversion and vigilance performance: 30 years of inconsistencies*. Psychological Bulletin, 112*(2)*,* 239–258*. http://dx.doi.org/10.1037//0033-2909.112.2.239*

Kraut, R. E. (1978). Verbal and nonverbal cues in the perception of lying. *Journal of Personality & Social Psychology, 36*(4)*,* 380-391. http://dx.doi.org/10.1037//0022-3514.36.4.380

Kraut. R. E. (1980). Humans as lie detectors: Some second thoughts. *Journal of Communication, 30*(4)*,* 209-218. http://dx.doi.org/10.1111/j.1460-2466.1980.tb02030.x

Livingstone Smith, D. (2004). *Why we lie: The evolutionary roots of deception and the unconscious mind.* New York, NY: St. Martin's Press.

Levenson, R. W. (2011). Basic Emotion Questions. *Emotion Review, 3*(4)*,* 379–386. http://dx.doi.org/10.1177/1754073911410743

Levine, T. R., & McCornack, S. A. (1991). The dark side of trust: Conceptualising and measuring types of communicative suspicion. *Communication Quarterly, 39*(4)*,* 325-340. http://dx.doi.org/10.1080/01463379109369809

Levine, T. R., Park, H. S., & McCornack, S. A. (1999). Accuracy in detecting truths and lies: Documenting the "veracity effect". *Communication Monographs, 66*(2)*,* 125-144. http://dx.doi.org/10.1080/03637759909376468

Levine, T. R. (2014). Truth-Default Theory (TDT) A theory of human deception and deception detection. *Journal of Language and Social Psychology, 33*(4), 378-392. http://dx.doi.org/10.1177/0261927x14535916

Lishner, D. A., Cooter, A. B., & Zald, D. H. (2008). Rapid emotional contagion and expressive congruence under strong test conditions. *Journal of Nonverbal Behaviour, 32*(4)*,* 225-239. http://dx.doi.org/10.1007/s10919-008-0053-y

Lui, M. & Rosenfeld, J. P. (2008). Detection of deception about multiple, concealed, mock crime items, based on a spatial-temporal analysis of ERP amplitude and scalp distribution. *Psychophysiology, 45*(5), 721-730. http://dx.doi.org/10.1111/j.1469-8986.2008.00683.x

MacPherson, S. E., Phillips, L. H., & Della Sala, S. (2002). Age, executive function and social decision-making: A dorsolateral prefrontal theory of cognitive aging. *Psychology and Aging, 17*(4), 598–609. http://dx.doi.org/10.1037//0882-7974.17.4.598

Malatesta, C. Z., Izard, C. E., Culver, C., & Nicolich, M. (1987). Emotion communication skills in young, middle-aged and older women. *Psychology and Aging, 2*(2), 193–203. http://dx.doi.org/10.1037//0882-7974.2.2.193

Malone, B., & DePaulo, B. M. (2001). Measuring sensitivity to deception. In J. A. Hall & F. J. Bernieri (Eds.), *Interpersonal sensitivity: Theory and measurement* (pp. 103–124). Mahwah, NJ: Erlbaum.

Manera, V., Grandi, E., & Colle, L. (2013). Susceptibility to emotional contagion for negative emotions improves detection of smile authenticity. *Frontiers in Human Neuroscience, 7*(6), 147-182. http://dx.doi.org/10.3389/fnhum.2013.00006

Marsh, T., & Boag, S. (2013). Evolutionary and differential psychology: Conceptual conflicts and the path to integration. *Frontiers in Psychology, 4,* 655. http://dx.doi.org/10.3389/fpsyg.2013.00655

Matsumoto, D., & Hwang, H. S. (2011). Evidence for training the ability to read microexpressions of emotion. *Motivation and Emotion, 35*(2), 181–191. http://dx.doi.org/10.1007/s11031-011-9212-2

Matsumoto, D., LeRoux, J., Wilson-Cohn, C., Raroque, J., Kooken, K., Ekman, P., … & Goh, A. (2000). A new test to measure emotion recognition ability: Matsumoto and Ekman's Japanese and Caucasian Brief Affect Recognition Test (JACBART). *Journal of Nonverbal Behaviour, 24*(3), 179-209. http://dx.doi.org/10.1007/978-94-007-0753-5_102150

Matthews, G., Zeidner, M., & Roberts, R. D. (2002). *Emotional intelligence: Science and myth.* Cambridge, MA: MIT Press.

Mayer, J. D., Salovey, P., & Caruso, D. R. (2000). Models of emotional intelligence. In R. J. Sternberg (Ed.). *Handbook of human intelligence* (pp. 396-420). New York, NY: Cambridge University Press.

Mayer, J. D., Roberts, R. D., & Barsade, S. G. (2008). Human abilities: Emotional intelligence. *Annual Review of Psychology, 59,* 507–536. http://dx.doi.org/10.1146/annurev.psych.59.103006.093646

Mayer, J. D., Salovey, P., & Caruso, D. R. (2009). Emotional intelligence: Theory, findings and implications. *Psychological Inquiry, 15*(3), 197-215. http://dx.doi.org/10.1207/s15327965pli1503_02

McCrae, R. R. *(*1987*).* Creativity, divergent thinking, and openness to experience*. Journal of Personality and Social Psychology, 52*(6)*,* 1258–*1265. http://dx.doi.org/10.1037//0022-3514.52.6.1258*

McCrae, R. R., & John, O. (1992). An introduction to the five-factor model and its applications. *Journal of Personality, 60*(2)*,* 175-215. http://dx.doi.org/10.1111/j.1467-6494.1992.tb00970.x

McDowell, C. L., Harrison, D. W., & Demaree, H. A. (1994). Is right hemisphere decline in the perception of emotion a function of aging? *International Journal of Neuroscience, 79*(1-2), 1–11. http://dx.doi.org/10.3109/00207459408986063

Meissner, C. A., & Kassin, S. M. (2002). “He’s guilty!”: Investigator bias in judgements of truth and deception. *Law and Human Behaviour, 26*(5), 469-480. http://dx.doi.org/10.1023/A:1020278620751

Mertens, R. & Allen, J. J. B. (2008). The role of psychophysiology in forensic assessments: Deception detection, ERPs, and virtual reality mock crime scenarios. *Psychophysiology, 45*(2), 286-298. http://dx.doi.org/10.1111/j.1469-8986.2007.00615.x

Montagne, B., Kessels, R. P. C., Frigerio, E., de Haan, E. H. F., & Perrett, D. (2005). Sex differences in the perception of affective facial expressions: Do men really lack emotional sensitivity? *Cognitive Processing, 6*(2), 136-141. http://dx.doi.org/10.1007/s10339-005-0050-6

Ono, M., Sachau, D. A., Deal, W. P., Englert, D. R., & Taylor, M. D. (2011). Cognitive ability, emotional intelligence, and the Big Five personality dimensions as predictors of criminal investigator performance. *Criminal Justice and Behavior*, *38*(5), 471–491. http://dx.doi.org/10.1177/0093854811399406

O'Sullivan, M. (2005). Emotional intelligence and deception detection: Why most can't 'read' others, but a few can. In R. E. Riggio & R. Feldman (Eds.), *Applications of nonverbal communication* (pp. 215–310). Mahwah, NJ: Lawrence Erlbaum Associates Publishers.

Park, H. S., Levine, T. R., McCornack, S. A., Morrison, K., & Ferrara, M. (2002). How people really detect lies. *Communication Monographs, 69*(2), 144-157. http://dx.doi.org/10.1080/714041710

Park, K. K., Suk, H. W., Hwang, H., & Lee, J. H. (2013). A functional analysis of deception detection of a mock crime using infared thermal imaging and the Concealed Information Test. *Frontiers in Human Neuroscience, 7*(7), 70. http://dx.doi.org/10.3389/fnhum.2013.00070

Paulhus, D. L. (2017). Socially desirable responding on self-reports. *Encyclopedia of Personality and Individual Differences,* 1-5. http://dx.doi.org/10.1007/978-3-319-28099-8_1349-1

Peace, K. A., Porter, S., & Almon, D. F. (2011). Sidetracked by emotion: Observers' ability to discriminate genuine and fabricated sexual assault allegations. *Legal & Criminological Psychology*, *17*(2), 322-335. http://dx.doi.org/10.1111/j.2044-8333.2011.02013.x

Peace, K. A., & Sinclair, S. M. (2012). Cold-blooded lie catchers? An investigation of psychopathy, emotional processing, and deception detection. *Legal & Criminological Psychology, 17,* 177–191. http://dx.doi.org/10.1348/135532510x524789

Petrides, K. V., & Furnham, A. (2000). On the dimensional structure of emotional intelligence. *Personality & Individual Differences, 29*(2), 313-320. http://dx.doi.org/10.1016/s0191-8869(99)00195-6

Petrides, K. V., Frederickson, N., & Furnham, A. (2004). The role of trait emotional intelligence in academic performance and deviant behaviour at school. *Personality and Individual Differences*, *36*(2), 277–293. http://dx.doi.org/10.1016/s0191-8869(03)00084-9

Petrides, K. V., & Furnham, A. (2006). The role of trait emotional intelligence in a gender-specific model of organisational variables. *Journal of Applied Social Psychology, 36,* 552-569. http://dx.doi.org/10.1111/j.0021-9029.2006.00019.x

Petrides, K. V., Pérez-González, J. C., & Furnham, A. (2007). On the criterion and incremental validity of trait emotional intelligence. *Cognition and Emotion, 21,* 26-55. http://dx.doi.org/10.1080/14789940903174246

Phillips, L. H., MacLean, R. D. J., & Allen, R. (2002). Aging and the perception and understanding of emotions. *Journals of Gerontology, Series B: Psychological Sciences and Social Sciences, 57*(6), 526-530. http://dx.doi.org/10.1093/geronb/57.6.p526

Piaget, J. (1972). *The psychology of intelligence.* Totowa, NJ: Littlefield Adams.

Porter, S., Woodworth, M., & Birt, A. R. (2000). Truth, lies, and videotape: An investigation of the ability of federal parole officers to detect deception. *Law and Human Behaviour, 24*(6), 643-658. http://dx.doi.org/10.1023/a:1005500219657

Porter, S., & ten Brinke, L. M. (2008). Reading between the lies: identifying concealed and falsified emotions in universal facial expressions. *Psychological Science, 19*(5), 508–514. http://dx.doi.org/10.1111/j.1467-9280.2008.02116.x

Porter, S., ten Brinke, L., & Wallace, B. (2011). Secrets and lies: involuntary leakage in deceptive facial expressions as a function of emotional intensity. *Journal of Nonverbal Behavior, 36*(1), 23-37. http://dx.doi.org/10.1007/s10919-011-0120-7

Porter, S., ten Brinke, L., Baker, A., & Wallace, B. (2011). Would I lie to you?: 'Leakage' in deceptive facial expressions relates to psychopathy and emotional intelligence. *Personality & Individual Differences*, *51*(2), 133-137. http://dx.doi.org/10.1016/j.paid.2011.03.031

Preston, S. D., & de Waal, F. B. M. (2002). Empathy: its ultimate and proximate bases. *Behavioural & Brain Sciences, 25,* 1-72. http://dx.doi.org/10.1017/s0140525x02000018

Pugh, S. D. (2001). Service with a smile: Emotional contagion in the service encounter. *Academy of Management Journal, 44*(5)*,* 1018-1027. http://dx.doi.org/10.2307/3069445

Rahman, Q., Wilson, G. D., & Abrahams, S. (2004). Sex, sexual orientation, and identification of positive and negative facial affect. *Brain Cognition, 54*(3)*,* 179-185. http://dx.doi.org/10.1016/j.bandc.2004.01.002

Reik, T. (1948). *Listening with the third ear: The inner experience of a psychoanalyst.* New York, NY: Farrar, Strauss and Giroux.

Revelle, W., Wilt, J., & Condon, D M. (2010). Individual differences and differential psychology: A brief history and prospect. In T. Chamorro-Premuzic, A. Furnham & S. von Stumm (Eds.), *Handbook of individual differences.* New York, NY: Wiley-Blackwell.

Russell, J. A., Bachorowski, J. A., & Fernandez-Dols, J. M. (2003). Facial and vocal expressions of emotion. *Annual Review of Psychology, 54*(1)*,* 329-349. http://dx.doi.org/10.1146/annurev.psych.54.101601.145102

Saklofske, D. H., Austin, E. J., & Minski, P. S. (2003). Factor structure and validity of a trait emotional intelligence measure. *Personality and Individual Differences, 34*(4), 707-721. http://dx.doi.org/10.1016/s0191-8869(02)00056-9

Schutte, N. S., Malouff, J. M., Hall, L. E., Haggerty, D. J., Cooper, J. T., Golden, C. J., & Dornheim, L. (1998). Development and validation of a measure of emotional intelligence. *Personality & Individual Differences, 25*(2)*,* 167-177. http://dx.doi.org/10.1016/s0191-8869(98)00001-4

Seiter, J. S., Bruschke, J., & Bai, C. (2002). The acceptability of deception as a function of perceivers' culture, deceiver's intention, and deceiver-deceived relationship. *Western Journal of Communication, 66*(2), 158-180. http://dx.doi.org/10.1080/10570310209374731

Semmler, C., & Brewer, N. (2002). Effects of mood and emotion on juror processing and judgements. *Behavioural Sciences & the Law, 20*(4), 423-436. http://dx.doi.org/10.1002/bsl.502

Seto, M. C., Khattar, N. A., Lalumiere, M. L., & Quinsey, V. L. (1997). Deception and sexual strategy in psychopathy. *Personality and Individual Differences, 22*(3), 301–307. http://dx.doi.org/10.1016/s0191-8869(96)00212-7

Shoda, Y., Mischel, W., & Peake, P. K. (1990). Predicting adolescent cognitive and self-regulatory competencies from preschool delay of gratification: Identifying diagnostic conditions. *Developmental Psychology, 26*(6), 978-986. http://dx.doi.org/10.1037//0012-1649.26.6.978

Singer, T. (2006). The neuronal basis and ontogeny of empathy and mind-reading: Review of literature and implications for future research. *Neuroscience & Biobehavioural Review, 30*(6), 855-863. http://dx.doi.org/10.1016/j.neubiorev.2006.06.011

Snarey, J. R., & Vaillant, G. E. (1985). How lower- and working-class youth become middle-class adults: The association between ego defense mechanisms and upward social mobility. *Child Development, 56*(4), 899-910. http://dx.doi.org/10.2307/1130102

Sonnby-Borgstrom, M. (2002). Automatic mimicry reactions as related to differences in emotional empathy. *Scandinavian Journal of Psychology, 43*(5), 433-443. http://dx.doi.org/10.1111/1467-9450.00312

Sporer, S. L., & Schwandt, B. (2006). Paraverbal indicators of deception: A meta-analytic synthesis. *Applied Cognitive Psychology, 20*(4), 421- 446. http://dx.doi.org/10.1002/acp.1190

Sporer, S. L., & Schwandt, B. (2007). Moderators of nonverbal indicators of deception: A meta-analytic synthesis. *Psychology, Public Policy, & Law, 13*(1), 1-34. http://dx.doi.org/10.1037/1076-8971.13.1.1

Sprengelmeyer, R., Young, A. W., Calder, A. J., Karnat, A., Lange, H., Hömberg, V., Perrett, D. I., & Rowland, D. (1996). Loss of disgust. *Brain, 119*(5), 1647-1665. http://dx.doi.org/10.1093/brain/119.5.1647

Stel, M., & van Knippenberg, A. (2008). The role of facial mimicry in the recognition of affect. *Psychological Science, 19*(10), 984-985. http://dx.doi.org/10.1111/j.1467-9280.2008.02188.x

Sternberg, R. J. (1988). *The triarchic mind: A new theory of human intelligence.* New York, NY: Viking.

Street, C. N. H. (2015). ALIED: Humans as adaptive lie detectors. *Journal of Applied Research in Memory & Cognition, 4*(4), 335-343. http://dx.doi.org/10.1016/j.jarmac.2015.06.002

Strömwall, L., & Granhag, P. A. (2003). How to detect deception? Arresting the beliefs of police officers, prosecutors and judges. *Journal of Psychology, Crime & Law, 9*(1), 19-36. http://dx.doi.org/10.1080/10683160308138

Sullivan, S., & Ruffman, T. (2004). Emotion recognition deficits in the elderly. *International Journal of Neuroscience, 114*(3), 403–432. http://dx.doi.org/10.1080/00207450490270901

ten Brinke, L., & Porter, S. (2011). Cry me a river: Identifying the behavioural consequences of extremely high-stakes interpersonal deception. *Law & Human Behavior*, 36(6), 469-477. http://dx.doi.org/10.1037/h0093929

ten Brinke, L., Porter, S., & Baker, A. (2012). Darwin the detective: Observable facial muscle contraction reveal emotional high-stakes lies. *Evolution and Human Behaviour, 33*(4), 411-416. http://dx.doi.org/10.1016/j.evolhumbehav.2011.12.003

Underwood, B. J. (1975). Individual differences as a crucible in theory construction. *American Psychologist, 30*(2), 128-134. http://dx.doi.org/10.1037/h0076759

van de Mortel, T. F. (2008). Faking it: Social desirability response bias in self-report research. *Australian Journal of Advanced Nursing, 25*(4), 40.

Vassallo, S., Cooper, S. L., & Douglas, J. M. (2009). Visual scanning in the recognition of facial affect: Is there an observer sex difference? *Journal of Vision, 9*(3)*,* 1-11. http://dx.doi.org/10.1167/9.3.11

Vrij, A., & Graham, S. (1997). Individual differences between liars and the ability to detect lies. *Expert evidence, 5,* 144-148.

Vrij, A., Edward, K., Roberts, K. P., & Bull, R. (2000). Detecting deceit via analysis of verbal and nonverbal behaviour in children and adults. *Journal of Nonverbal Behaviour, 24*(4), 239-263. http://dx.doi.org/10.1023/a:1006610329284

Vrij, A., & Mann, S. (2001). Who killed my relative? Police officers' ability to detect real-life highstake lies. *Psychology, Crime, & Law*, *7*(1-4), 119–132. http://dx.doi.org/10.1080/10683160108401791

Vrij, A. (2008). *Detecting lies and deceit: Pitfalls and opportunities.* Chichester, United Kingdom: Wiley.

Vrij, A., Fisher, R., Mann, S., & Leal, S. (2008). A cognitive load approach to lie detection. *Journal of Investigative Psychology and Offender Profiling, 5*(1), 39-43. http://dx.doi.org/10.1002/jip.82

Vrij, A., Granhag, P. A., & Porter, S. (2011). Pitfalls and opportunities in nonverbal and verbal lie detection. *Psychological Science in the Public Interest, 11*(3), 89–121. http://dx.doi.org/10.1177/ 1529100610390861

Vrij, A., & Verschuere, B. (2013). Lie detection in a forensic context. In D. S. Dunn (Ed.), *Oxford Bibliographies.* New York, NY: Oxford University Press.

Warren, G., Schertler, E., & Bull, P. (2009). Detecting deception from emotional and unemotional cues. *Journal of Nonverbal Behaviour, 33*(1), 59–69. http://dx.doi.org/10.1007/s10919-008-0057-7

Wechsler, D. (1939). *The measurement of adult intelligence.* Baltimore, MD: William and Wilkins.

Wells, L. J., Gillespie, M. S., & Rotshtein, P. (2016). Identification of emotional facial expressions: Effects of expression, intensity, and sex on eye gaze. *PLoS ONE, 11*(12), e0168307. http://dx.doi.org/10.1371/journal.pone.0168307

Wojciechowski, J., Stolarski, M., & Matthews G. (2014). Emotional intelligence and mismatching expressive and verbal messages: A contribution to detection of deception. *PLOS One, 9*(3), e92570. http://dx.doi.org/10.1371/journal.pone.0092570

Young, A., Perrett, D., Calder, A., Sprengelmeyer, R., & Ekman, P. (2002). *Facial expressions of emotion: Stimuli and tests (FEEST).* Retrieved from https://www.researchgate.net/profile/Reiner_Sprengelmeyer/publication/252068424_Facial_expressions_of_emotion_Stimuli_and_tests_FEEST/links/02e7e5315a1722136d000000/Facial-expressions-of-emotion-Stimuli-and-tests-FEEST.pdf

Zuckerman, M., DePaulo, B. M., & Rosenthal, R. (1981). Verbal and nonverbal communication of deception. In L. Berkowitz (Ed.), *Advances in experimental social psychology* (Vol. 14, pp. 1–60). New York, NY: Academic.

Appendix 1 - Email Text

(Subject: Seeking Participants for Research Study).

Dear _____,

I am seeking participants for an academic study that is being conducted as part of my Master's level research dissertation project. This study aims to measure the effect of individual differences on the ability to accurately detect deception. If you did participate in this study, you would be required to complete a self-reported measure of Emotional Intelligence and a self-reported measure of Emotional Contagion. Further, you would be shown images depicting faces demonstrating different emotions and asked to state which emotion you believe is present. Finally, you will be required to watch some short pubic appeals for missing or murdered relatives, similar to those commonly broadcast on televised news reports, and asked to indicate whether you believe that the person making the appeal is being truthful and is not involved in their relative's disappearance or is being deceitful and is involved. This study will take approximately 45 minutes to an hour to complete. To take part in this study you must be aged 18 or over and have normal or corrected vision and hearing.

If you are interested in participating or have any questions about this study please email me on 1321968@chester.ac.uk.

Thank you in advance.

Best Regards,

Lauren McCreanney.

Appendix 2 – Ethics Form

Staff / Office Use Only **DOPEC NUMBER: _____**

Umbrella project DOPEC number (staff)_____

APPLICANT SURNAME: McCreanney

Please complete the form below indicating attached materials. Prior to submission supervisors must

APPLICATION STATUS: NEW APPL ON, MAJOR AMENDMENT, RESUBMISSION

APPLICATION FOR: DISSERTAT TEACHING, RESEARCH & PUBLICATION

ATTTENDENCE AT HEALTH & SAFETY BRI G: YES / NO / NA

INCLUSION OF RISK ASSESSMENT FORM YES / NO / NA

NOTES ON THE ROLE AND FUNCTION OF DEPARTMENT OF PSYCHOLOGY ETHICS COMMITTEE.

- *All decisions of the committee are bas n the application form and reviewers comments ONLY. Forms should be as detailed and clear ossible. Verbal discussions are not considered as part of the application or review process.*
- *The review process strictly adheres to University of Chester Research Governance Handbook and the BPS Code of Ethics.*
- *The decision of the committee is final. ou are a UG, PGT or PGR student you should discuss the decision of the committee with your s visor. If you are a member of staff you may contact the chair of the committee for further cla ion*

Before completing the form researchers are e ted to familiarise themselves with the regulatory codes and codes of conduct and ethics relevant to their s of research, including those of relevant professional organisations and ensure that research which propose is designed to comply with such codes.

Department of Psychology Ethical Approval f search: Procedural Guidelines.

University of Chester Research Governance H ook

http://gamma.chester.ac.uk/view.php?ti =522471

BPS Code of Ethics

http://www.bps.org.uk/system/files/Public% s/bps_code_of_ethics_2009.pdf

otes: Students to indicate where information is found, supervisor to confirm by ticking green column	Supervisor confirmation	GE sheetInformation.	Letter	Email	PageEmailInfo.	FormConsent	PowerPoint	N/A
Brief details about the purpose of the study	☒	☒	☐	☒	☐	☐	☒	☐
Contact details for further information	☒	☒	☐	☒	☐	☐	☒	☐
Explanation of how and why participant has been chosen	☒	☒	☐	☐	☐	☐	☐	☐
Notification that materials/interviews are not diagnostic tools, therapy or used for staff review/development purposes	☒	☒	☐	☐	☐	☐	☐	☐
Explanation participation is voluntary	☒	☒	☐	☐	☐	☒	☐	☐
Details of any incentives or compensation	☒	☒	☐	☐	☐	☐	☒	☐
Details of how consent will be obtained	☒	☒	☐	☐	☐	☒	☐	☐
If research is observational, consent to being observed	☐	☐	☐	☐	☐	☐	☐	☒
Details of how data will be stored and participants' information protected	☒	☒	☐	☐	☐	☐	☐	☐
Details of time commitments expected	☒	☒	☐	☐	☐	☐	☒	☐
Details of any stimuli used	☒	☒	☐	☒	☐	☐	☐	☐
Explanation of right to withdraw and right to withdraw procedure	☒	☒	☐	☐	☐	☒	☐	☐
Option for omitting questions participant does not wish to answer	☒	☒	☐	☐	☐	☐	☐	☐
Procedure regarding partially completed questionnaires or interviews	☒	☒	☐	☐	☐	☐	☐	☐
With interviews, information regarding time limit for withdrawal	☐	☐	☐	☐	☐	☐	☐	☒
Details of any advantages and benefits to taking part	☒	☒	☐	☐	☐	☐	☐	☐
Details of any disadvantages and risks of taking part	☒	☒	☐	☐	☐	☐	☐	☐
Information that data will be treated with full confidentiality and that, if published, those data will not be identifiable as theirs	☒	☒	☐	☐	☐	☐	☐	☐
Debriefing details	☒	☒	☐	☐	☐	☐	☐	☐
Dissemination information	☒	☒	☐	☐	☐	☐	☐	☐
Further information (relevant literature; support networks etc)	☒	☒	☐	☐	☐	☐	☐	☐

Supervisor Signature: ***Date:*** ***05/04/2017***

IN COMPLETING THE FORM UG & PGT STUDENTS PLEASE REFER TO YOUR HANDBOOK

Question 1: Working title of the study

Notes: The title should be a single sentence

The Effect of Individual Differences on the Ability to Accurately Detect Deception.

Question 2: Applicant, name and contact details.

Notes: The primary applicant is the name of the person who has overall responsibility for the study. Include their appointment or position held and their qualifications. For studies where students and/or research assistants will undertake the research, the primary applicant is the student (UG, PGT, PGR) and supervisor is the co-applicant.

Lauren McCreanney, MSc Psychology (Conversion) student at the University of Chester.

Email address: 1321968@chester.ac.uk

Question 3: Co-applicants

Notes: List the names of all researchers involved in the study. Include their appointment or position held and their qualifications.

Dr Clea Wright MA (Hons), MSc, PhD, CPsychol , FHEA

Email address: clea.wright@chester.ac.uk

Question 4: What are the start and end dates of the study?

Notes: If exact dates are unavailable, explain why and give approximate dates.

April 2017 – September 2017.

Question 5: Is this project subject to external funding?

Notes: Please provide details of the funding body, grant application and PI.

No.

Question 6: Briefly describe the purpose and rationale of the research

Notes: In writing the rationale make sure that the research proposed is grounded in relevant literature, and the hypotheses emerge from recent research and are logically structured.

PGR / Staff if this application is for a funded project please attach any detailed research proposals as appropriate.

Maximum word length (300 words)

Research suggests that processing facial emotion is important in the detection of deception, as emotional leakage may accompany lying (Ekman, 2003). Therefore, individuals who have high accuracy in facial emotion recognition may also have high accuracy in detecting deception, if they can detect incongruence between facial and verbal messages. Also, evidence suggests that there is a link between emotional intelligence and deception detection (Lyons, Healy & Bruno, 2013), however this is contradicted by research that suggests that individuals with high emotional intelligence may have higher gullibility when identifying liars (Baker et al., 2013). Further, individuals with high emotional contagion have been found to have an enhanced ability to determine whether a facial expression is deceptive or genuine (Bernstein et al., 2008). Yet, evidence in this area is considered sparse and often contradictory (Manera, Grandi & Colle, 2013), therefore further research is needed. A link has been discovered between facial emotion recognition and emotional intelligence (Mayer, DePaulo & Salovey, 1990), and some emotional intelligence tests incorporate measures using facial expressions of emotion (Salovey, Mayer, Caruso & Lopes, 2001). Yet this link has been disputed (Zuckerman, Hall, DeFrank & Rosenthal. 1976), therefore the applicant will test both of these variables independently of one another.

The researcher hypothesises that individuals who display high accuracy in facial emotion recognition will also display high accuracy in detection deception. However, the researcher hypothesises that individuals with high emotional intelligence and high emotional contagion may have higher gullibility, therefore will be less able to accurately detect deception. This research will be analysed through a correlational design.

This is an area that is not short of research, yet there does not appear to be a study that incorporates emotional intelligence, emotional contagion and facial emotion recognition as variables. Though this study aims to investigate the relationship between these variables and the ability to detect deception, the research may also be able to answer questions about the links between the variables themselves, as discussed previously. The aim of this study is to find evidence that may provide some clarity to this research area.

Question 7: Describe the methods and procedures of the study

Notes: Attach any relevant material (questionnaires, supporting information etc.) as appendices and summarise them briefly here (e.g. Cognitive Failures Questionnaire: a standardised self-report measure on the frequency of everyday cognitive slips). Do not merely list the names of measures and/or their acronyms. Include information about any interventions, interview schedules, duration, order and frequency of assessments. It should be clear exactly what will happen to participants. If this is a media based study describe and list materials include links and sampling procedure. (500 words)

This study will take place in a lab or equivalent quiet, safe setting. For the first part of this study, participants will be asked to complete a standardised self-report measure of Emotional Intelligence, developed by Schutte et al., (1997) (see appendix). This is a 33-item measure. Participants will then be asked to complete a standardised self-report measure of Emotional Contagion, developed by Doherty (1997) (see appendix). This is a 15-item index that takes less than five minutes to complete. Both focus on personality variables and are not clinical or diagnostic measures. Both of the original measures have been amended to contain an option for those who do not wish to answer a question. Additionally, participants will be shown 28 images of faces that are demonstrating different emotions; happiness, sadness, fear, anger, disgust, surprise and a neutral face. Participants will be asked to indicate which emotion they think is evident by marking a tick box that is labelled against the appropriate emotion (see appendix). Ekman and Friesen's (1976) pictures of facial affect will be utilised for this part of the study.

For the second part of the study, participants will be shown 10 video clips of public appeals, similar to those broadcast during televised news reports. The appealers in the clips will be asking for information about a missing or murdered relative. 5 of these videos involve an appealer that is being truthful and 5 involve an appealer that is being deceptive. These videos will be provided by the research supervisor. Each clip will be between 30 seconds and two minutes long. After viewing each clip, participants will be asked to complete a questionnaire that consists of one question; " Do you think that the appealer is telling the truth and is not involved in the person's disappearance or is being deceptive and is involved?". The questionnaire will feature three tick boxes; one stating that the appealer is being truthful, one stating that the appealer is being deceptive and one that states that the participant has seen this clip before or is familiar with the case (see appendix). The study should take between 45 minutes and 1 hour to complete approximately. Each participant will be alone with the researcher throughout the study and will be advised to stop the study at any time if they feel distressed.

Question 8: Has the person carrying out the study had previous experience of the procedures? If not, who will supervise that person?

Notes: Say who will be undertaking the procedures involved and what training and/or experience they have. If supervision is necessary, indicate who will provide it.

The applicant has no previous experience of this procedure. The research supervisor Dr Clea Wright will provide advice to the applicant throughout the completion of this study.

Question 9: What ethical issues does this study raise and what measures have been taken to address them?

Notes: Describe any discomfort or inconvenience that participants may experience. Include information about procedures that for some people could be physically stressful or might impact on the safety of participants, e.g. interviews, probing questions, noise levels, visual stimuli, equipment; or that for some people could be psychologically stressful, e.g. mood induction procedures, tasks with high failure rate. Discuss any issues of anonymity and confidentiality as they relate to your study, refer to ethics handbook and guidance notes at the end of the form. If animal based include ethical issues relating to observation.

Participants will be required to watch real life footage of appeals consisting of people asking for information about their missing or murdered relatives, which may be distressing. However, there is not expected to be any undue distress as these appeals are similar to those that are commonly broadcast during televised news reports. Participants will be told about the content of these appeals beforehand and will be advised to tell the applicant if they do not want to continue watching the appeals, in which case the study will stop.

Question 10: Who will the participants be?

Notes: Describe the groups of participants that will be recruited and the principal eligibility criteria and ineligibility criteria. Make clear how many participants you plan to recruit into the study in total.

I plan to recruit 60 participants into this study, the majority of which will be friends, family and work colleagues. To participate in this study, participants must be aged 18 or over with normal or corrected vision and hearing.

Question 11: Describe participant recruitment procedures for the study

Notes: Gives details of how potential participants will be identified or recruited. Include all advertising materials (social media messages, posters, emails, letters, verbal script etc.) as appendices and refer to them as appropriate. Describe any screening examinations. If it serves to explain the procedures better, include as an appendix a flow chart and refer to it.

To recruit participants, I will send an email (see appendix) and will display posters (see appendix) to advertise the study around the university and in my work place with permission from my manager – (once permission has been received, it will be submitted as an amendment). I also plan to use RPS as a recruitment tool, and will post an advertisement on to this site (see appendix).

Question 12: Describe the procedures to obtain informed consent

*Notes: Describe when consent will be obtained. If consent is from **adult participants**, give details of who will take consent and how it will be done. If you plan to seek informed consent from **vulnerable groups** (e.g. people with learning difficulties, victims of crime), say how you will ensure that consent is voluntary and fully informed.*

*If you are recruiting **children or young adults** (aged under 18 years) specify the age-range of participants and describe the arrangements for seeking informed consent from a person with parental responsibility. If you intend to provide children under 16 with information about the study and seek agreement, outline how this process will vary according to their age and level of understanding.*

How long will you allow potential participants to decide whether or not to take part? What arrangements have been made for people who might not adequately understand verbal explanations or written information given in English, or who have special communication needs?

If you are not obtaining consent, explain why not.

Potential participants will be given a participant information sheet (see appendix) and a written consent form (see appendix) which they can chose to sign after reading the information sheet. The consent forms will be collected by the applicant who will be available to answer any questions participants may have prior to the study.

Question 13: Will consent be written?

Yes

*Notes: If **yes**, include a consent form as an appendix. If **no**, describe and justify an alternative procedure (verbal, electronic etc.) in the space below.*

Guidance on how to draft Participant Information sheet and Consent form can be found on PS6001 Moodle space and in the Handbook.

Question 14: What will participants be told about the study? Will any information on procedures or the purpose of study be withheld?

Notes: Include an Information Sheet that sets out the purpose of the study and what will be required of the participant as appendices and refer to it as appropriate. If any information is to be withheld, justify this decision. More than one Information Sheet may be necessary.

Participants will be given an Information Sheet that outlines the purpose of this study and explains in brief detail what is required of participants. No information about the study will be withheld from participants.

Question 15: Will personally identifiable information be made available beyond the research team (e.g. report to organisation)?

Notes: If so, indicate to whom and describe how confidentiality and anonymity will be maintained at all stages.

This study does not require participants to provide any personal or identifying information.

Question 16: What payments, expenses or other benefits and inducements will participants receive?

Notes: Give details. If it is monetary say how much, how it will be paid and on what basis is the amount determined. Indicate RPS credits.

Participants who require RPS credits will be awarded 3 RPS credits. Those who do not will not receive any benefits.

Question 17: At the end of the study, what will participants be told about the investigation?

Notes: Give details of debriefings, ways of alleviating any distress that might be caused by the study and ways of dealing with any clinical problem that may arise relating to the focus of the study.

At the end of the study, the applicant will check the wellbeing of the participant verbally and participants will be provided with a Debrief Sheet (see appendix). The debrief sheet provides further information about the purpose of this study and includes contact details of places where participants can seek support if they feel that they need it.

Question 18: What arrangements are there for data security during and after the study?

Notes: Digital data stored on a computer requires compliance with the Data Protection Act; indicate if you have discussed this with your supervisor and describe any special circumstances that have been identified from that discussion. Say who will have access to participants' personal data and for how long personal data will be stored or accessed after the study has ended.

All paper based records will be transferred on to a computer and then stored within a locked cabinet. The data will also be stored on a USB stick for the researcher supervisor, and only the applicant and the research supervisor will have access to the data. Both the computer and the USB stick will be password protected.

Signatures of the study team (including date) L McCreanney 04/04/2017

Appendix 3 - Emotional Intelligence Scale (Schutte et al., 1998)

Please indicate the extent to which each item applies to you using the following scale:

1 = Strongly Disagree

2 = Disagree

3 = Neither Agree Nor Disagree

4 = Agree

5 = Strongly Agree

Please circle the relevant number or, if you do not feel comfortable to answer, circle "prefer not to answer".

1. I know when to speak about my personal problems to others.	**1**	**2**	**3**	**4**	**5**	**Prefer not to answer**
2. When I am faced with obstacles, I remember times I faced similar obstacles and overcame them.	**1**	**2**	**3**	**4**	**5**	**Prefer not to answer**
3. I expect that I will do well on most things I try.	**1**	**2**	**3**	**4**	**5**	**Prefer not to answer**
4. Other people find it easy to confide in me.	**1**	**2**	**3**	**4**	**5**	**Prefer not to answer**
5. I find it hard to understand the nonverbal messages of other people.	**1**	**2**	**3**	**4**	**5**	**Prefer not to answer**
6. Some of the major events of my life have led me to re-evaluate what is important and not important.	**1**	**2**	**3**	**4**	**5**	**Prefer not to answer**
7. When my mood changes, I see new possibilities.	**1**	**2**	**3**	**4**	**5**	**Prefer not to answer**
8. Emotions are some of the things that make my life worth living.	**1**	**2**	**3**	**4**	**5**	**Prefer not to answer**
9. I am aware of my emotions as I experience them.	**1**	**2**	**3**	**4**	**5**	**Prefer not to answer**
10. I expect good things to happen.	**1**	**2**	**3**	**4**	**5**	**Prefer not to answer**
11. I like to share my emotions with others.	**1**	**2**	**3**	**4**	**5**	**Prefer not to answer**
12. When I experience a positive emotion, I know how to make it last.	**1**	**2**	**3**	**4**	**5**	**Prefer not to answer**
13. I arrange events others enjoy.	**1**	**2**	**3**	**4**	**5**	**Prefer not to answer**
14. I seek out activities that make me happy.	**1**	**2**	**3**	**4**	**5**	**Prefer not to answer**
15. I am aware of the nonverbal messages I send to others.	**1**	**2**	**3**	**4**	**5**	**Prefer not to answer**
16. I present myself in a way that makes a good impression on others.	**1**	**2**	**3**	**4**	**5**	**Prefer not to answer**

17. When I am in a positive mood, solving problems is easy for me. **1 2 3 4 5 Prefer not to answer**

18. By looking at their facial expressions, I recognize the emotions people are experiencing. **1 2 3 4 5 Prefer not to answer**

19. I know why my emotions change. **1 2 3 4 5 Prefer not to answer**

20. When I am in a positive mood, I am able to come up with new ideas. **1 2 3 4 5 Prefer not to answer**

21. I have control over my emotions. 1 **2 3 4 5 Prefer not to answer**

22. I easily recognize my emotions as I experience them. **1 2 3 4 5 Prefer not to answer**

23. I motivate myself by imagining a good outcome to tasks I take on. **1 2 3 4 5 Prefer not to answer**

24. I compliment others when they have done something well. **1 2 3 4 5 Prefer not to answer**

25. I am aware of the nonverbal messages other people send. **1 2 3 4 5 Prefer not to answer**

26. When another person tells me about an important event in his or her life, I almost feel as though I have experienced this event myself. **1 2 3 4 5 Prefer not to answer**

27. When I feel a change in emotions, I tend to come up with new ideas. **1 2 3 4 5 Prefer not to answer**

28. When I am faced with a challenge, I give up because I believe I will fail. **1 2 3 4 5 Prefer not to answer**

29. I know what other people are feeling just by looking at them. **1 2 3 4 5 Prefer not to answer**

30. I help other people feel better when they are down. **1 2 3 4 5 Prefer not to answer**

31. I use good moods to help myself keep trying in the face of obstacles. **1 2 3 4 5 Prefer not to answer**

32. I can tell how people are feeling by listening to the tone of their voice. 1 **2 3 4 5 Prefer not to answer**

33. It is difficult for me to understand why people feel the way they do. **1 2 3 4 5 Prefer not to answer**

Appendix 4 – Emotional Contagion Scale (Doherty, 1997)

1.*Never* = Never true for me.
2.*Rarely* = Rarely true for me.
3. Usually = Usually true for me.
4.*Often* = Often true for me.
5.*Always* = Always true for me.

Please circle the relevant number or, if you do not feel comfortable to answer, circle "prefer not to answer".

1. If someone I'm talking with begins to cry, I get teary-eyed.	**1**	**2**	**3**	**4**	**5**	**Prefer not to answer**
2. Being with a happy person picks me up when I'm feeling down.	**1**	**2**	**3**	**4**	**5**	**Prefer not to answer**
3. When someone smiles warmly at me, I smile back and feel warm inside.	**1**	**2**	**3**	**4**	**5**	**Prefer not to answer**
4. I get filled with sorrow when people talk about the death of their loved ones.	**1**	**2**	**3**	**4**	**5**	**Prefer not to answer**
5. I clench my jaws and my shoulders get tight when I see the angry faces on the news.	**1**	**2**	**3**	**4**	**5**	**Prefer not to answer**
6. When I look into the eyes of the one I love, my mind is filled with thoughts of romance.	**1**	**2**	**3**	**4**	**5**	**Prefer not to answer**
7. It irritates me to be around angry people.	**1**	**2**	**3**	**4**	**5**	**Prefer not to answer**
8. Watching the fearful faces of victims on the news makes me try to imagine how they might be feeling.	**1**	**2**	**3**	**4**	**5**	**Prefer not to answer**
9. I melt when the one I love holds me close.	**1**	**2**	**3**	**4**	**5**	**Prefer not to answer**
10. I tense when overhearing an angry quarrel.	**1**	**2**	**3**	**4**	**5**	**Prefer not to answer**
11. Being around happy people fills my mind with happy thoughts.	**1**	**2**	**3**	**4**	**5**	**Prefer not to answer**
12. I sense my body responding when the one I love touches me.	**1**	**2**	**3**	**4**	**5**	**Prefer not to answer**
13. I notice myself getting tense when I'm around people who are stressed out.	**1**	**2**	**3**	**4**	**5**	**Prefer not to answer**
14. I cry at sad movies.	**1**	**2**	**3**	**4**	**5**	**Prefer not to answer**
15. Listening to the shrill screams of a terrified child in a dentist's waiting room makes me feel nervous.	**1**	**2**	**3**	**4**	**5**	**Prefer not to answer**

Appendix 5 – Participant Information Sheet

The Effect of Individual Differences on the Ability to Accurately Detect Deception

PARTICIPANT INFORMATION SHEET

What is the purpose of the study?

This is an academic study that aims to measure the effect of individual differences on the ability to accurately detect deception. I am interested in the relationship between levels of emotional intelligence, recognition of facial emotion and susceptibility to emotional contagion and deception detection accuracy. This study is being conducted as part of my PS7112 Research Dissertation for my postgraduate degree.

Why have I been chosen to take part?

You have been invited to participate in this study as an opportunity sample. You must be aged 18 or over and have normal or corrected vision and hearing, as the study involves watching some video clips.

What do I have to do?

The study should take approximately 45 minutes to an hour to complete. Firstly, you will be asked to complete a self-reported measure of Emotional Intelligence and a self-reported measure of Emotional Contagion. These are not clinical or diagnostic measures, rather they focus on personality variables that are present in the general population. You will have the option to not answer a question if you do not feel comfortable.

You will then be shown 28 images depicting faces demonstrating different emotions and will be asked to state which emotion you think is being shown. Following this, you will be required to watch 10 short public appeals for missing or murdered relatives, similar to those that are often used in news reports. Of these clips, five will involve a deceitful appealer and five will involve a truthful appealer. These appeals are real and may be linked to murder, so you

may find these clips emotional. If you think that this will be distressing, please do not take part in the study. You will be asked to decide whether you believe the person making the appeal is being truthful and is not involved in their relative's disappearance or is being deceitful and is involved. After watching each clip you will be asked to indicate your judgement by completing a questionnaire that consists of two tick boxes; one truthful and one deceitful. On completion of the study you will be provided with a debrief sheet.

Who is conducting the study?

I am currently studying a postgraduate degree in Psychology at the University of Chester and I am the principle research of this study. I will be responsible for conducting the study and analysing the data which will contribute to my research dissertation project (PS7112 – Research Dissertation). If you have any questions, issues or complaints regarding the study, please contact either myself Lauren McCreanney on 1321968@chester.ac.uk or the research supervisor Dr Clea Wright on clea.wright@chester.ac.uk.

Is participation voluntary?

Participation in this study is entirely voluntary. You can choose to not be involved in the study or can withdraw from the experiment at any time. You can also choose to withdraw your data from the study, however this must be done before submitting the data to the researcher, as no identifying information will be collected. Any partially completed data will be destroyed. If you do withdraw from the study you can do so without providing a reason.

What are the risks and benefits of taking part in this study?

It is not believed that there is any risk of physical or psychological harm associated with participation in this study. Some materials used within this study are highly emotional, therefore it is advised that you do not participate if you feel that you may find this upsetting. If you begin to feel distressed or upset at any stage during the experiment please inform the researcher who will stop the

study immediately. Participation in this study will be rewarded with 3 RPS credits for psychology students. If you do not require RPS credits, no other benefit is offered.

What about confidentiality?

Following the completion of the experiment, your data will remain confidential. The data collected during the study will be secured in a file and later transferred to a password protected computer and USB stick. Only myself and the research supervisor, Dr Clea Wright, will have access to the data. All data collected will be anonymous.

What about the results?

The results will be analysed and used within my postgraduate research dissertation project.

What if I have any issues or questions after the study?

If you have any issues or questions following the experiment, please contact either myself Lauren McCreanney on 1321968@chester.ac.uk or the research supervisor Dr Clea Wright on clea.wright@chester.ac.uk. If you require any further support you can contact Student Support and Guidance on 01244 511550 or student.welfare@chester.ac.uk, or your PAT. If you are not a student at the University of Chester you can contact the Samaritans on 116 123 or jo@samaritans.org for further support.

Ethical Approval

Ethical approval for this study has been sought and obtained from The University of Chester's Department of Psychology Ethics Committee.

Appendix 6 – Consent Form

University of Chester

Title of Project: The Effect of Individual Differences on the Ability to Accurately Detect Deception.

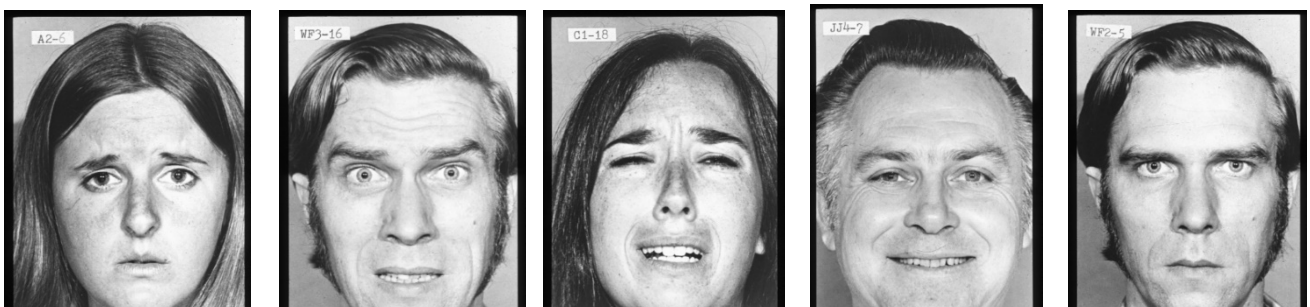
Name of Researcher: Lauren McCreanney
Name of co-researcher: Dr Clea Wright

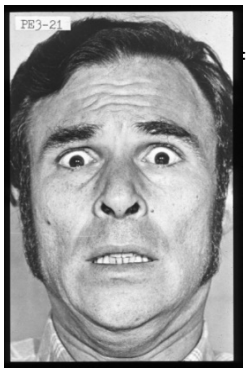
Please initial box

1. I confirm that I have read and understand the participant information sheet for the above study. ☐
2. I understand that my participation is voluntary and that I am free to withdraw at any time, without giving any reason and without my rights being affected. ☐
3. I agree to take part in the above study. ☐

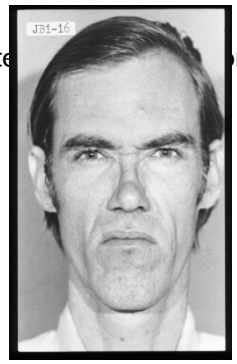
Please note that this consent form will be stored separately from your data to maintain anonymity of your data.

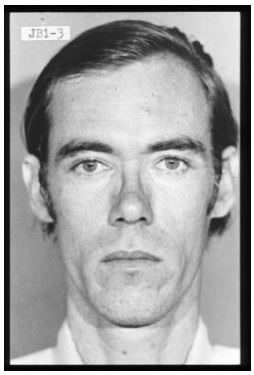
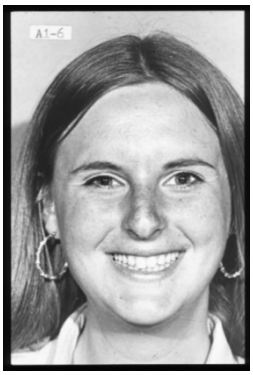
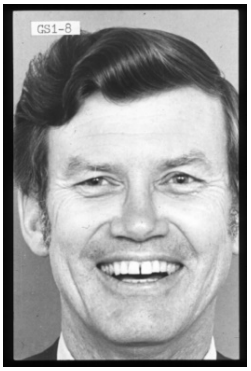
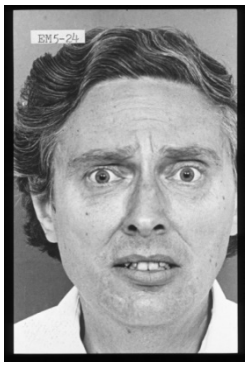
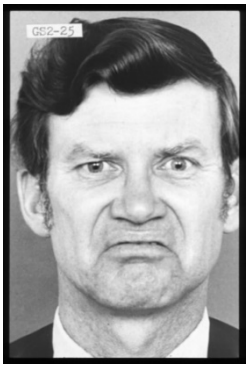
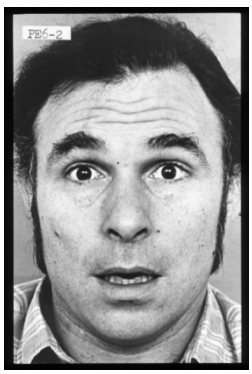
Appendix 7 – Pictures of Facial Affect (Ekman & Friesen, 1976)

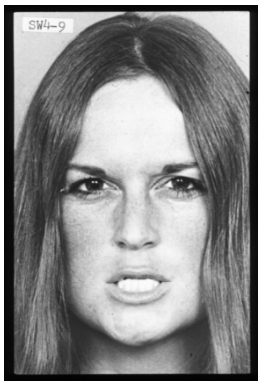


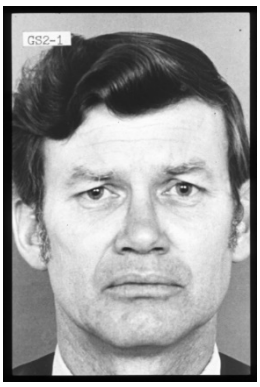
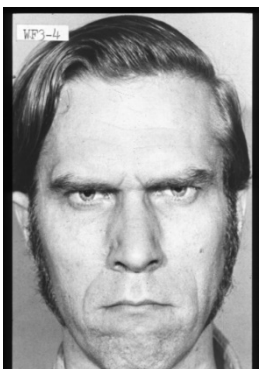

PE3-21

PF2-4

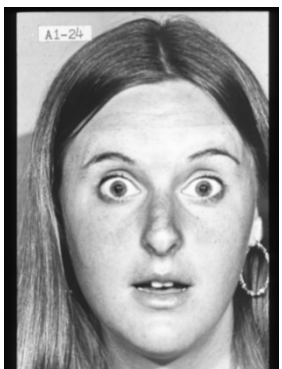
SW1-16

JB1-16

SW1-30

JB1-3

A1-6

GS1-8

EM5-24

GS2-25

PE6-2

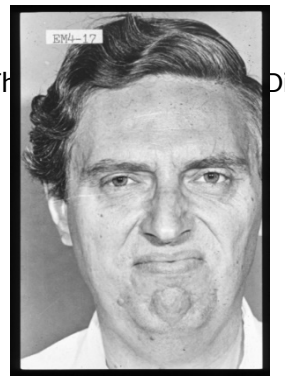
PF2-12

SW4-9

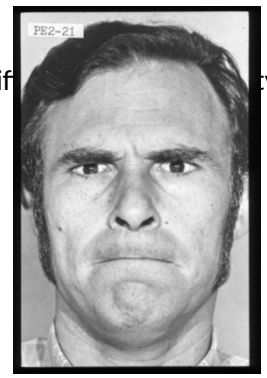
C1-23

GS2-1

WF3-4

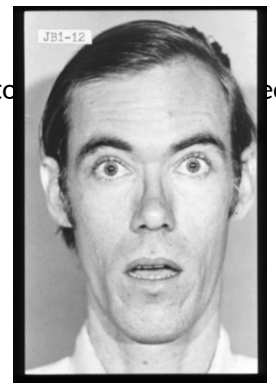
C2-3

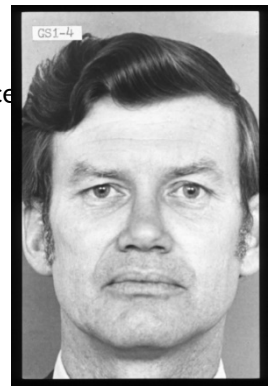
PF1-5

A1-24

Th Dif y to ece









Appendix 8 – Pictures of Facial Affect Marking Sheet

	Happiness	Sadness	Fear	Anger	Surprise	Disgust	Neutral
Image 1							
Image 2							
Image 3							
Image 4							
Image 5							
Image 6							
Image 7							
Image 8							
Image 9							
Image 10							
Image 11							
Image 12							
Image 13							
Image 14							
Image 15							
Image 16							
Image 17							
Image 18							
Image 19							
Image 20							
Image 21							
Image 22							

Image 23							
Image 24							
Image 25							
Image 26							
Image 27							
Image 28							

Appendix 9 – Video Clip Check Boxes

Video Clip 1

Do you think this appealer is being;

Truthful ☐

Deceitful ☐

I have seen this clip before and am familiar with this case ☐

Appendix 10 – Debrief Sheet

The Effect of Individual Differences on the Ability to Accurately Detect Deception

DEBRIEF INFORMATION

Thank you for participating in this study. I hope you found the experience enjoyable.

The study investigated the relationship between the ability to accurately detect deception and individual levels of emotional intelligence, emotional contagion and ability to detect facial emotion. This study focused on high-stake deception,

meaning that there is a high risk for the appealer and a high level of emotional context.

The information that I gathered from you today will allow for the analysis of these three factors in relation to deception detection. Prior to the study, it was predicted that individuals who displayed high accuracy in facial emotion recognition would also display high accuracy in detection deception. Further, it was hypothesised that individuals with high emotional intelligence and high emotional contagion may have higher gullibility, therefore will be less able to accurately detect deception.

If you have any further questions, feel unhappy or have a problem please do not hesitate to contact either myself Lauren McCreanney on 1321968@chester.ac.uk or the research supervisor Dr Clea Wright on clea.wright@chester.ac.uk. For further support, you can contact Student Support and Guidance on 01244 511550 or student.welfare@chester.ac.uk, or your PAT. If you are not a student at the University of Chester for further support you can contact the Samaritans on 116 123 or jo@samaritans.org.